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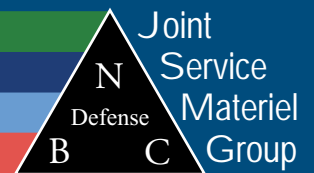
Detailed equipment data has been removed from the appendices of this internet version of the LSP. References in the text to information in the appendices are provided for illustrative purposes only.

Supporting Planning Period FY01-07

# Joint Service **N**uclear, **B**iological and **C**hemical Defense Logistics Support Plan



ARMY  
NAVY  
AIR FORCE  
MARINE CORPS



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DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY FOR RESEARCH,  
DEVELOPMENT AND ACQUISITION  
103 ARMY PENTAGON, WASHINGTON, DC 20310-0103

DEPARTMENT OF THE AIR FORCE  
OFFICE OF THE ASSISTANT SECRETARY FOR ACQUISITION  
1060 AIR FORCE PENTAGON, WASHINGTON, D.C. 20330-1060



DEPARTMENT OF THE NAVY  
HEADQUARTERS US MARINE CORPS SYSTEM COMMAND  
2033 BARNETT AVE, QUANTICO, VA 22134-5010

DEPARTMENT OF THE NAVY  
HEADQUARTERS US NAVY SEA SYSTEMS COMMAND  
2531 JEFFERSON DAVIS HWY, ARLINGTON, VA 22242-5160

**JOINT SERVICE MATERIEL GROUP**

CHAIRMAN/EXECUTIVE OFFICE  
ABERDEEN PROVING GROUND, MD 21010-5424

**JOINT SERVICE NUCLEAR, BIOLOGICAL AND CHEMICAL DEFENSE  
LOGISTICS SUPPORT PLAN**

The 2001 Joint Service NBC Defense Logistics Support Plan represents a Joint Service Integrated Product Team (IPT) effort to improve how the Services and Defense Logistics Agency field and manage NBC defense equipment. This comprehensive report identifies the DoD readiness and sustainment status of NBC defense equipment, maintenance sustainment issues and industrial base concerns. As we in the logistics community have the responsibility for total life cycle management of our products, this study offers an important tool for DoD logistics managers to identify readiness challenges and initiate corrective actions where necessary.

JOHN L. PALMAN  
Process Manager for Logistics Support

## **Preface:**

The 2001 Joint Service NBC Defense Logistics Support Plan (LSP) is divided into two main sections. The first section, identified by white tabs, is the narrative findings of the LSP. This includes the executive summary and introduction, a general discussion of the overall NBC defense logistics process, the DoD readiness and sustainment status based on the September 2000 data call, a review of maintenance sustainment issues related to NBC defense items, and a discussion of ongoing studies involving the NBC defense industrial base.

The red tabbed section contains the raw data used to develop this report. The results of the September 2000 DoD data call are at Appendix A, and the results of the April 1999 JCHEMRATES IV study are at Appendix B. Charts on each fielded NBC defense item and those items to be fielded within FY01-07 are found at Appendices C-G. Summaries of the industrial base analyses are at Appendix H.

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## Acronyms

ACADA	Automatic Chemical Agent Detector and Alarm
AERP	Aircrew Eye/Respiratory Program
AMEDD	Army Medical Department
APC	Armored Personnel Carrier
APS	Army Prepositioned Stocks
ASL	Authorized Stockage List
ATNAA	Antidote Treatment Nerve Agent Autoinjector
AWCF	Army War Capital Funds
BDO	Battle Dress Overgarment
BIDS	Biological Integrated Detection System
BVO	Black Vinyl Overboot
BW	Biological Warfare
CAA	Center for Army Analysis
CAM	Chemical Agent Monitor
CANA	Convulsant Antidote for Nerve Agent
CAPDS	Chemical Agent Point Detection System
CB	Chemical Biological
CBMS	Chemical and Biological Mass Spectrometer
CBPS	Chemical Biological Protective Shelter
CDE	Chemical Defense Equipment
CHATH	Chemically/Biologically Hardened Air Transportable Hospital
CINC	Commander-in-Chief
CLSC	Contractor Logistics Support Center
CPE	Collective Protection Equipment
CP DEPMEDS	Chemically Protected Deployable Medical System
CPS	Collective Protection System
CTA	Common Table of Allowances
CW	Chemical Warfare
DAP	Decontamination Apparatus Portable
DBOF	Defense Base Operating Fund
DLA	Defense Logistics Agency
DM/CLS	Depot Maintenance/Contractor Logistics Support
DoD	Department of Defense
DPG	Defense Planning Guidance
DRB	Division Ready Brigade
DS-2	Decontamination Solution - 2
DSCP	Defense Supply Center Philadelphia
DS/GS	Direct Support/General Support
DTRA	Defense Threat Reduction Agency
EOD	Explosive Ordnance Disposal
FDA	Food and Drug Administration
FUE	First Unit Equipped
GVO	Green Vinyl Overboots

HMMWV	High Mobility Multi-Purpose Wheeled Vehicle
HQDA	Headquarters Department of the Army
IBAD	Interim Biological Agent Detector
IBMC	Industrial Base Maintenance Contract
ICAM	Improved Chemical Agent Monitor
IND	Investigational New Drug
IPDS	Improved Point Detection System
IPT	Integrated Product Team
JBPDS	Joint Biological Point Detection System
JCAD	Joint Chemical Agent Detector
JCHEMRATES	Joint Chemical Defense Equipment Consumption Rates
JMAR	Joint Medical Asset Repository
JPACE	Joint Protective Aircrew Ensemble
JPO-BD	Joint Program Office for Biological Defense
JSAM	Joint Service Aircrew Mask
JSBDS	Joint Service Biological Standoff Detection System
JSCBIS	Joint Chemical-Biological Information System
JSCESM	Joint Service Chemical Environment Survivability Mask
JSGPM	Joint Service General Protection Mask
JSIG	Joint Service Integration Group
JSLNBCRS	Joint Service Light NBC Reconnaissance System
JSLSCAD	Joint Service Lightweight Stand-Off Chemical Agent Detector
JSMG	Joint Service Materiel Group
JSWILD	Joint Service Warning and Identification LIDAR Detector
JTAV	Joint Total Asset Visibility
JTCOPS	Joint Transportable Collective Protection System
JWARN	Joint Warning and Reporting Network
LAV	Light Armored Vehicle
LDS	Lightweight Decontamination System
LIDAR	LIght Detection And Ranging
LIN	Line Item Number
LNBCRS	Lightweight Nuclear, Biological, and Chemical Reconnaissance System
LR-BSDS	Long Range-Biological Standoff Detection System
LSP	Logistics Support Plan
MANAA	Medical Aerosolized Nerve Agent Antidote
MBDRP	Medical Biological Defense Research Program
MDS	Modular Decontamination System
MICAD	Multipurpose Integrated Chemical Agent Detector
MES	Medical Equipment Set
MICS	Multiman Integrated Cooling System
MPS	Maritime Prepositioning Ships
MTW	Major Theater of War
MULO	Multi-Purpose Overboot
NAADS	Nerve Agent Antidote Delivery System
NAAK	Nerve Agent Antidote Kit
NALMEB	Norway Air Landed Marine Expeditionary Brigade

NAPP	Nerve Agent Pyridostigmine Pretreatment
NBC	Nuclear, Biological, and Chemical
NBCRS	Nuclear, Biological, and Chemical Reconnaissance System
NDA	New Drug Application
NDI	Non-Developmental Item
NICP	National Inventory Control Point
NSN	National Stock Number
O&M	Operations and Maintenance
OGI	Overguidance Issue
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
OMA	Operations and Maintenance (Army)
OMN	Operations and Maintenance (Navy)
OPNAV	Operations, U.S. Navy
OPTEMPO	Operational Tempo
OSD	Office of the Secretary of Defense
OTSG	Office of the Surgeon General
PATS	Protective Assessment Testing System
PB	Pyridostigmine Bromide
PDDA	Power Driven Decontamination Apparatus
PDR	Preliminary Design Review
PLL	Prescribed Load List
POC	Point of Contact
POM	Program Objective Memorandum
P3I	Pre-Planned Product Improvement
RDA	Research, Development, and Acquisition
RDT&E	Research, Development, Test and Evaluation
RFP	Request For Proposal
RICC	Reportable Items Control Codes
ROM	Rough Order of Magnitude
RSCAAL	Remote Sensing Chemical Agent Alarm
SALAD	Shipboard Automatic Liquid Agent Detector
SBCCOM	Soldier and Biological Chemical Command
SCALP	Suit Contamination Avoidance Liquid Protection
SCPE	Simplified Collective Protection Equipment
SECDEF	Secretary of Defense
STB	Super Tropical Bleach
SSR	Supply Support Request
TAP	Toxicological Agent Protective
USAMMA	U.S. Army Medical Materiel Agency
USAMMDA	U.S. Army Medical Materiel Development Activity
USD/A&T	Undersecretary of Defense for Acquisition and Technology
WRALC	Warner-Robins Air Logistics Center
WRSI	War Reserve Secondary Item

## Logistics Support Plan IPT Membership

### **Organization**

U.S. Army ODCSLOG

Naval Sea Systems Command

HQ U.S. Air Force

U.S. Marine Corps Logistics Bases

Defense Logistics Agency

Joint Service Materiel Group EO

Joint Service Integration Group Sec.

Joint Service NBC Defense Bd Sec.

Joint Staff/J-4

U.S. Army MEDCOM

U.S. Army SBCCOM-RI

## Executive Summary

The Joint Service Nuclear, Biological and Chemical (NBC) Defense Logistics Support Plan (LSP) for 2001 focuses on the Department of Defense's (DoD) readiness and sustainment capabilities, specifically their ability to survive and sustain combat operations in an NBC-contaminated environment. The measures used to determine this are the two Major Theater War (MTW) scenario requirements as calculated using the results of the Service-approved April 1999 Joint Chemical Defense Equipment Consumption Rates (JCHEMRATES) IV study. This report is best viewed as a snapshot in time of the DoD logistics status as of October 1, 2000, when the Services and Defense Logistics Agency (DLA) submitted the results of their respective data calls. Based on these requirements, the overall status of NBC defense logistics continues to improve over the next five years, with the exception of a small number of end items and consumables.

The two MTW requirements should not be confused with the total Service requirements. Because of the requirement to equip active and Reserve forces, to train warfighters during peacetime, and to support maintenance and sustainment requirements, the Services may actually require more than the two MTW requirements calculated from the JCHEMRATES IV study. The JCHEMRATES requirements should be seen as the minimum requirements that give the Services a capability to survive and sustain combat operations in an NBC-contaminated environment.

In the development of the 2000 report, the Logistics Support Plan Integrated Product Team agreed to redefine the two MTW requirements to include the sum of the initial issue plus the consumption calculated by the JCHEMRATES IV study for consumables. This was done to insure that our forces have sufficient stocks remaining after the conflict to enter yet another conflict. At that time the IPT also suggested that the JCHEMRATES IV study should be revisited and refined to include requirements for supporting military forces (Army and Air Force transportation support, Navy fleet in theater, Marine Corps forces on ships, etc.).

### **Two MTW Requirement for Consumables**

Previous definition: equal to the greater of JCHEMRATES Initial Issue **or** Consumption  
⇒ No inventory remains after 120 days

New definition: equal to JCHEMRATES Initial Issue **plus** Consumption  
⇒ Some inventory remains after 120 days

***Readiness for the next conflict is enhanced***

Our findings are displayed by commodity area, identifying shortages in fielded end items and consumables in particular (addressed in Table E-1). Specifically, our findings show nineteen fielded CB defense end items are short the required two MTW requirements, and forty-nine CB defense consumable items are short the two MTW requirements. The total funding shortfall across all four Services projected in FY07 amounts to \$1407.0 million, assuming no changes in the procurement patterns identified in the report.

This LSP includes information on new equipment entering the inventory identified in the Joint Service NBC Defense Research, Development and Acquisition (RDA) Plan. For the purposes of simplicity, we limited the inclusion of developmental items to those being actively procured over the next seven years (FY01-07). Some of these items are replacing or augmenting

existing fielded items; in these cases, we have illustrated the transition plan from older equipment to new equipment. We have also provided preliminary sustainment funding estimates for depot maintenance and contractor logistics support for these programs. Funding plans for developmental CB defense equipment have been identified in the CB Defense POM Strategy and have not been duplicated in this plan. See Appendix A (DoD and Service Data Call) page A-5 for a complete listing of developmental NBC defense items reviewed.

Using the April 1999 JCHEMRATES IV study to determine the average two MTW requirement (which for consumables is redefined to include initial issue plus consumption) the DoD NBC defense program has the following shortfalls measured against the Services' projected quantities in FY07 (see table E-1).

**Table E-1 DoD NBC Defense Shortfalls in Fielded Equipment – FY07 Status (Avg MTW Rqmts)**

**End Items (Jointly Funded)**

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	33	7	94.4
Individual Protection	13	8	88.9
Collective Protection	5	1	14.6
Decontamination	6	2	34.9
Medical	1	1	2.9
<b>TOTAL</b>	<b>58</b>	<b>19</b>	<b>\$235.7 M</b>

**Consumables (Service O&M Funded)**

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	11	9	15.2
Individual Protection	39	18	623.3
Collective Protection	7	7	33.8
Decontamination	10	5	106.2
Medical	12	7	392.8
<b>TOTAL</b>	<b>79</b>	<b>46</b>	<b>\$1171.3 M</b>

**Funding Shortfalls by Service**

Service	End Items - jointly funded (\$ millions)	Consumables – Service funded (\$ millions)	Total Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Army	70.6	782.2	852.8
Air Force	100.5	131.4	232.0
Navy	31.3	184.8	216.1
Marine Corps	33.3	72.8	106.1
<b>TOTAL</b>	<b>\$235.7 M</b>	<b>\$1171.3 M</b>	<b>\$1407.0 M</b>



In the contamination avoidance commodity area, equipment shortfalls are seen in the AN/UDR-13, AN/PDR-43, AN/PDR-65, AN/PDR-75, CP-95, and PP-4276/PD radiacs and accessories, the CAM/ICAM, ACADA, and M21 RSCAAL. Consumable shortfalls exist for the M8 and M9 detector papers, M272 Water Test Kit, M256A1 Detector Kit, M273/M293 Maintenance Kits, and BA-5590 and BA5800 batteries. In the individual protection commodity area, equipment shortfalls exist for the MCU-2/P Mask, AR-5A/P22P2, M41 PATS; M42A2, and M45 Masks; the Clothing Test Kit, and the Mask Communications Adapter. Consumable shortfalls include the JSLIST Suit, SCALP, Chemical Protective Undergarment, CWU-66/77P, CP Helmet Cover, M40 Hood, M40 Second Skin, EOD M-3 TAP, CP Socks, CP Footwear Cover, Disposable Footwear Cover, MCU-2/P Hood, 7-, 14-, and 25-mil gloves, Glove Inserts, Aircrewman Cape, C2/C2A1 Filter Canisters, and several TAP accessories from the Air Force. The redefined 2 MTW requirements along with recent reductions in the number of available BDOs were responsible for new shortfalls identified in the projected inventory of JSLIST Suits.

In the collective protection commodity area, the M20A1 SCPE remains short of its requirements. Most of the consumable large filters are short their requirements, to include the M12A2, M13, M18A1, M19, and M48A1 filters, and the Filter Set for M59/M56/Shipboard, and the Shipboard CPE Pre-Filter. In the decontamination commodity area, equipment shortfalls exist for the M13 DAP and the M17-series LDS. Consumable shortfalls exist for nitrogen cylinders used in the M11 DAP, M295 Decon Kit, STB, and DS-2, in particular the 1 1/3 quart can, and M13 Can. The DS-2 shortfalls represent the bulk of the decontamination consumable shortfalls, but the impact of the re-defined average two MTW requirements is lessened by a return to JCHEMRATES III requirements for DS-2. In the medical CB defense commodity area, shortfalls of the NAAK/ATNAA, Atropine and Pralidoxime Chloride Autoinjectors, tetracycline, PB tablets, and the Antidote Treatment Kit for Cyanide, exist. There are also shortages of Decontaminable Folding Litters. Recent definition of requirements for Ciprofloxacin highlighted shortages in that area also.

Maintenance sustainment of fielded NBC defense equipment includes both depot maintenance and contractor logistics support (DM/CLS) efforts. Our study identified funding shortfalls among the Services that inhibit their full maintenance capability. The Army reported a funding shortfall of \$2.947 million. Navy shortfalls for system repairs are being addressed internally with OPNAV sponsors. The Marine Corps reported \$9.7 million of unfunded repair requirements which includes part of a Product Improvement Plan for masks. Air Force depots have not reported any funding shortfalls specific to NBC defense equipment maintenance. This study also addressed the future maintenance and sustainment funding requirements for NBC defense equipment to be fielded between FY01-07. We determined preliminary maintenance and sustainment cost drivers for twelve developmental items, to include the, BIDS JBPDS Platform, JCAD, Block I and Block II JBPDS, JWARN, MICAD, JSLSCAD, LNBCRS and LAV version of the JSLNBCRS, JTCOPS, M48 Mask, JSGPM, JSCESM, JSAM, JPACE, and Modular Decon System. Some of the funding requirements represent a rough order of magnitude estimate of what the burden may be, as a forecasting tool for the Service project managers and military depots. Others were from data supplied by program managers at the JSMG's request at their respective commodity area reviews.

NBC defense industries have a limited ability to augment specific shortfalls during any future contingency, in part due to lowered DoD procurements and the inability to retain warm production lines in critical areas. There have been a number of assessments on industry's ability to address shortages of NBC defense equipment, where particular shortages have been identified as being critical. In many cases, additional procurements would assist in reducing these critical areas; in a few instances, more guidance is necessary to strengthen key areas of the NBC defense sector. Summary evaluations on NBC defense equipment are included, identifying actions required if industry is to support individual DoD shortfalls during future contingencies. The results of the initial screenings are presented here. Further assessments are ongoing and will be briefed in more detail in successive LSPs and Annual Reports to Congress.

Overall, the NBC defense logistics situation is improving slightly, given a downsized force structure and consolidated joint requirements. With the four Services' and DLA's approval of the JCHEMRATES IV requirements, the burden of planning and anticipating joint service requirements of NBC defense end items and consumables will become easier as both logistics planning offices and DoD item managers are working with the same numbers. Complications with current inventories of BDOs and DS-2 have introduced potentially large shortfalls for protective suits and decontaminants for thorough decontamination. Additionally, of concern is the continued lack of total asset visibility over unit-level inventory, while depot-level wholesale/retail stocks are more easily tracked and managed. A number of particular items continue to exhibit extreme shortages, due to continued historical patterns of low peacetime demands and high wartime requirements (e.g., large collective protection filters, decontamination kits, batteries, and antibiotics).

## **1.0 INTRODUCTION**

### **1.1 Purpose**

The purpose of the Joint Nuclear, Biological and Chemical (NBC) Defense Logistics Support Plan (LSP) is to provide an assessment of the overall logistics readiness of the Armed Forces to survive and sustain combat operations in an NBC-contaminated environment. This report provides a management perspective on the current and projected readiness and sustainment status of the Department of Defense (DoD) NBC defense program as of 1 October 2000. Specifically, this report will:

- Determine the overall logistics status of DoD NBC Defense Program.
- Provide readiness and sustainment status of items in development, production and inventory, and identify their funding shortfalls.
- Develop common terms of reference for logistics definitions, assumptions and guidelines for joint requirements computations.
- Guide Service decisions on O&M funding of NBC defense logistics.
- Increase awareness of the need to program funds to support maintenance and sustainment cost drivers
- Identify critical industrial base issues.

This report reviews NBC defense logistics performed during research and development, as well as procurement, sustainment and storage of NBC defense equipment. Because NBC defense logistics is a Service-specific responsibility, the information reflected in this assessment is often discussed in terms of Service status and in overall DoD perspective.

The overall status of the Services' NBC defense inventory continues to improve, due to a progressive modernization program that replaces aging Service-unique equipment with joint service equipment and continuing logistics process improvements. The Services stand at a point, however, where units must maintain and operate a mix of new and old NBC defense equipment. Older stocks of Battle Dress Overgarments are still needed along with Joint Service Lightweight Integrated Suit Technology products. M8A1 alarms will remain in the field for several more years as the M22 Automatic Chemical Agent Detector/Alarm joins the force. Both systems will remain in the field until sufficient quantities of the Joint Chemical Agent Detector replace both. The A/E32U-8, M17A1 and M17A2 Lightweight Decontamination Systems all demand different spare parts and must bear the burden of all decontamination operations until enough M21/M22 Modular Decontamination Systems arrive in numbers to support the force.

The status of the current NBC defense program and its projected status in FY07 demonstrates the need to continue to study the potential effects of CB agents on the Armed Forces' ability to survive and sustain combat operations on the future battlespace. The U.S. military no longer has a Cold War scenario. DoD force downsizing has decreased overall DoD requirements of NBC defense equipment, based on fewer personnel, but not eliminated them. These events improve the outlook for NBC defense logistics, as lowered requirements meet the traditionally low stocks of NBC defense materiel. The drive for reduced inventory, less O&M

funds and “focused logistics” put an increased importance on the ability to manage these stocks as a joint service commodity area. Given these trends, the described “high-low” mix of NBC defense equipment demands accurate information to manage its logistics.

**Focused Logistics:** . . . is the ability to provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations.

*Joint Vision 2020*

*Joint Chiefs of Staff, June 2000*

Joint Vision 2020 and the respective Service visions all discuss the concept of “***focused logistics***.” Logistics systems and practices that performed adequately for the Cold War era are not responsive enough to meet the challenges of the future force. The DoD logistics system of 2020 must be as responsive and agile as the force it supports. The challenges that face the future force include: developing total asset visibility, being able to tailor and deploy logistics to support the task at hand, sustain a continuous flow of supplies with a smaller logistics “footprint,” and particularly in the case of NBC defense

equipment, support the four Services within a joint logistics structure. The goal is to develop logistics information that permits the Services and DLA to make informed judgments in these areas. As the LSP identifies equipment requirements and on-hand quantities, logistics centers can use “focused logistics” to get critical NBC defense equipment to the right place and at the right time.

This study outlines critical shortfalls within DoD NBC defense logistics that could imperil our force’s ability to survive and sustain combat operations on future battlespaces. There are a number of ongoing efforts that will improve asset visibility and the logistics processes in each Service and within DoD. As these efforts mature, it is our responsibility to stay current with logistics processes and improve the visibility of the NBC defense program, particularly as more joint research and development programs transition to the field. The goal for this LSP is to ensure the Services, DLA and other members of the logistics community have the information to develop plans and make recommendations on how to confront these vulnerabilities.

- Common definitions for logistics, especially concerning war reserve issues, will improve understanding of jointly managed CB defense items.
- Validated consumption rates will create a shared understanding of the requirements and the shortfalls.
- Annual assessments of the DoD NBC defense logistics status will ensure military leaders have the information they require to focus NBC logistics to the critical time and place on the future battlespace.

## 1.2 Background

### 1.2.1 FY98 Logistics Support Plan

The requirement to develop a Joint Service NBC Defense Logistics Support Plan is based on the Joint Service Agreement on NBC Defense. Specifically, the Joint Service Materiel Group (JSMG) will “ . . . develop a Joint Logistics Support Plan to link the acquisition process with the

sustainment of fielded NBC equipment.” This plan should include “. . . logistics-related information such as industrial base and war reserve issues, which will assist in the development of the consolidated NBC POM.”

A joint service Integrated Product Team (IPT) met in July 1997 to prepare the FY98 LSP. The group agreed to:

- Review the DoD status of nuclear, biological and chemical non-medical defense equipment, and medical chemical defense materiel.
- Use the Quadrennial Defense Review’s two Major Theater War (MTW) scenario and the Joint Service Chemical Defense Equipment Consumption Rates study (JCHEMRATES IV) as the baseline for Service requirements.
- Collect and analyze the data in synch with the Annual Report to Congress requirements.

The LSP IPT focused on the results of the JCHEMRATES IV study as a measuring tool to gauge the Services’ readiness status. JCHEMRATES IV reviewed the two Major Theater War (MTW) requirements and determined the amount of consumable CB defense equipment necessary to carry the Services and DLA through both contingencies. By using these numbers as a basis for the analysis, we can develop a forecast of the DoD’s ability to sustain combat operations in a CB warfare environment in future battlefield scenarios.

The JCHEMRATES IV study attempts to produce a single document that all Services will use to estimate expenditures and expenditure rates of CB defense equipment during two nearly simultaneous MTWs. These numbers will guide the Services in developing adequate stocks to support their forces, using a common set of scenarios, definitions and planning logic. Since NBC defense equipment is largely a jointly managed commodity area, this will benefit not only the Services in planning for contingency operations, but also logistics agencies such as DLA and the Army’s Soldier and Biological Chemical Command (SBCCOM), and Medical Logistics Agencies (USAMMA, AFMLO and NAVYLOG).

**JCHEMRATES IV** study is a jointly conducted, validated and approved approach to define DoD NBC defense requirements

The JCHEMRATES IV report output includes:

- Overall consumption by MTW.
- Service requirements in 10-day increments, 30-day roll-ups, and totals.
- Consumption of CB defense items, to include initial issue, conventional and chemical warfare scenario consumptions, and totals.
- Consumption rate factors for each CB defense consumable item.

Further discussion on the JCHEMRATES methodology is at Section 1.3, to include its assumptions, limitations, and use in this study.

The October 1997 data call and the draft JCHEMRATES IV study (results as of December 1997) made up the recommendations in the Annual Report to Congress dated February 1998. Because the JCHEMRATES study was not completed in FY98, the FY98 LSP was not officially validated and signed by the JSMG principals. While it was not officially validated, the study's findings were of value in identifying critical shortfalls.

### 1.2.2 FY99 Logistics Support Plan

On 9 September 1998, the FY99 Logistics Support Plan Integrated Product Team (IPT) initiated the FY99 Logistics Support Plan. At the LSP IPT's initial meeting, points of contact from the Services and Defense Logistics Agency (DLA) met to review the plan of action and decide on the parameters of the plan.

The LSP IPT developed a format and initiated the data call for all Services and DLA in October 1998. After collecting the data and analyzing the on-hand requirements against the JCHEMRATES requirements, the LSP IPT was able to develop an estimate of the shortfalls present in the DoD NBC defense logistics program. The results of this analysis were reviewed and staffed through the LSP IPT Service and DLA representatives in January 1999. Input from the Joint Service Integrated Product Team for Industrial Base Management Plan completed the logistics picture. In addition to developing an estimate of the readiness and sustainment shortfall, the FY99 LSP identifies existing industrial base and maintenance sustainment issues.

The U.S. Army Center for Army Analysis ran several iterations of the JCHEMRATES IV simulations, staffing the results with the Service logistics and operational centers. The Joint Staff/J-4 staffed the final results of the November 1998 study to the Services in January 1999. All four Services have accepted these results. Details of the study are in Section 1.3.

The analysis in the FY99 Joint Service Logistics Support Plan provided the basis for Chapter 4 of the 1999 Annual Report to Congress (logistics input).

### 1.2.3 FY00 Logistics Support Plan

The FY00 Logistics Support Plan was initiated by the Logistics Support Plan Integrated Product Team (IPT) on 17 August 1999. On that date, points of contact from the Services, Defense Logistics Agency (DLA), Joint Staff, and Joint NBC Defense Board met to discuss modifications to this year's plan. It was agreed that the goals of the report should remain the same as the previous year.

The LSP IPT deliberated aligning the two MTW requirement with that used for ammunition, such that the requirement for consumables would be equal to the sum of the initial issue plus the two MTW consumption calculated by JCHEMRATES. The LSP IPT approved this definition, which would permit some inventory to remain available after 120 days of conflict.

The LSP IPT initiated a data call for all Services and DLA in September 1999, based on the format developed in prior years. The on-hand and projected inventory were compared against

the re-defined two MTW requirements, and the LSP IPT calculated shortfalls present in the DoD NBC defense logistics program. These analyses were reviewed and staffed through the LSP IPT Service and DLA representatives. In addition, the FY00 LSP identifies existing industrial base and maintenance sustainment issues.

The U.S. Army Center for Army Analysis published the final form of JCHEMRATES IV in April 1999 when all four services accepted the results. Details of the study are in the next section.

#### 1.2.4 FY01 Logistics Support Plan

The Logistics Support Plan Integrated Product Team (IPT) initiated the FY01 Logistics Support Plan on 18 August 2000. At that time, points of contact from the Services, Defense Logistics Agency (DLA), Joint Staff, and Joint NBC Defense Board met to discuss modifications to this year's plan. The planning period for the FY01 plan was aligned with the current POM, extending to FY07.

Members of the LSP IPT initiated a data call for their respective Services and DLA in August 2000, in order to update the quantities reported in the previous year. The on-hand and projected inventory were compared against the two MTW requirements developed for the FY00 Plan, and the LSP IPT calculated shortfalls present in the DoD NBC defense logistics program. The Services were given the option of providing requirements in lieu of JCHEMRATES calculations that may not depict a realistic current scenario. These analyses were reviewed and staffed through the LSP IPT Service and DLA representatives. In addition, the FY01 LSP identifies existing industrial base and maintenance sustainment issues.

The analyses in this report are based on the results of the April 1999 JCHEMRATES IV Study. As of the publication of this report, a follow-on JCHEMRATES Study is in the planning stages. Therefore, the IPT re-visited the two MTW requirement for decontaminant DS2 and agreed that the requirement calculated by the JCHEMRATES III Study was more realistic. Additionally, new requirements for certain items were provided by individual services.

This analysis provides the basis for Chapter 3 and Annex E of the current Annual Report to Congress (logistics input). The Joint Service LSP ties the Joint Service Research, Development and Acquisition (RDA) Plan and CB Defense Program Objective Memorandum (POM) Strategy to the Annual Report, ensuring that all joint service NBC defense reports are coordinated and reflect an accurate picture of the NBC defense logistics status.

### 1.3 JCHEMRATES IV Study

The Joint Chemical Defense Equipment Consumption Rates (JCHEMRATES) IV Study examined a hypothetical future conflict in two Major Theater Wars, located in Southwest Asia and Northeast Asia, in the year 2006. Using Service-generated deployment lists to identify numbers of troops and equipment deploying to each theater, the study developed consumption rates for each item of chemical defense equipment utilized. Threat chemical employment was developed from the Defense Intelligence Agency and Joint Staff's J8 Weapons of Mass Destruction 97 studies. The Northeast Asia scenario features 120 days, and the Southwest Asia scenario features 90 days of combat. The program force operates within a dual MTW, near-simultaneous scenario with the framework of the 1998 Defense Planning Guidance.

The study included a base case for comparison, in which there was a chemical threat (anticipated enemy employment) but no actual use of chemical munitions. In this case, conventional munitions destroyed chemical defense equipment, and troops consumed chemical defense equipment while retaining a high protective posture and checking after all attacks to ensure chemical weapons were not employed. Four scenarios examining various levels of chemical munitions employment were examined:

- high use of chemical attacks under marginal weather conditions
- high use of chemical attacks under favorable weather conditions
- low use of chemical attacks under marginal weather conditions
- low use of chemical attacks under favorable weather conditions.

The high employment scenarios used approximately twice as many chemical weapons as the low employment scenarios. Each chemical scenario also took into account the conventional destruction of chemical defense equipment as well as the expected consumption during chemical and conventional attacks. Consumption rates were calculated for each consumable chemical defense equipment (CDE) item, by Service, for all environmental combinations in both theaters. The average rates are expressed in the number of items per 1,000 men per 30 days.

The total expenditure of each piece of equipment reflects the consumption of each item, by Service, for all environmental combinations in both theaters based on the consumption rates over the 90 or 120-day period. This includes conventional battle losses and replenishment required because of exposure to chemical warfare agents. The basis of issue, or initial issue quantities, is provided for a given number of troops deploying into theater, again by Service and by ten-day periods. The absolute minimum total sustainment required thus becomes the difference between the initial issue and the total expenditure for each item. If the initial issue is higher than the total expenditure, no resupply is required and the initial issue is the MTW requirement. If the total expenditure is higher than the initial issue, then resupply is required and the total expenditure becomes the MTW requirement. With this minimum requirement, there is the danger that no inventory will remain after 120 days. Therefore, for this report, the MTW requirement for consumables was changed to equal the initial issue plus the consumption (expenditure). This more closely aligns the requirement with other commodities, such as ammunition, and allows inventory to remain for the next contingency. The JCHEMRATES



average MTW requirements for the four chemical scenarios were used as the basis for the calculations in this report.

It should be emphasized that the JCHEMRATES IV study's two MTW requirement is not and should not be considered a procurement target. This study did not fully consider certain factors such as air transport into theaters of conflict or Navy fleet requirements for ships at sea; therefore it does not reflect the true total force requirement. The MTW requirement does not consider peacetime training requirements, sizing requirements, full procurement to the entire active and Reserve forces, or the increasing number of peacekeeping missions in recent years. While the Services agree with the methodology and intent of the study, it may require further refinement prior to becoming a fully accepted planning tool. The MTW requirement does denote a minimum planning number, which if the total DoD inventory drops below, may represent a critical shortfall for that particular item, which should be immediately addressed to avoid diminishing the force's NBC defense capability. Because of this limitation in the study, the Services have identified their total Service requirements as their procurement targets, while acknowledging JCHEMRATES as a necessary step in joint service management of the NBC defense program.

<b>The Goal: Validated Requirements For All Services.</b>
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## 2.0 NBC Defense Logistics Process

### 2.1 Purpose

This section outlines the basic NBC defense logistics processes within the four Services and DLA. While each Service retains its own unique and separate logistics process to satisfy Title X responsibilities, joint NBC defense programs must be designed to operate within multiple Services' logistics processes. To provide an understanding of how joint NBC defense programs and items are handled within this framework, Section 2 is a review of the Services' and DLA's processes of determining requirements, funding NBC defense equipment procurement, purchasing consumables and parts, maintenance, and sustainment and storage procedures.

The sections are broken down as follows:

#### 2.2 Service Requirements

- 2.2.1 End Items
- 2.2.2 Consumables
- 2.2.3 Spare and Repair Parts
- 2.2.4 War Reserve Materiel

#### 2.3 Service Funding

- 2.3.1 End Items
- 2.3.2 Consumables
- 2.3.3 Spare and Repair Parts
- 2.3.4 Maintenance
- 2.3.5 War Reserve Materiel

### 2.2 Service Requirements for NBC Defense Equipment

#### 2.2.1 End Items

Generally, the four Services use the same process to determine their initial requirements for NBC defense end items. Each Service has a central office that works with other Service agencies to coordinate NBC defense procurement issues. These offices analyze the defense planning guidance, future force structure requirements, the end items' capabilities, validate the number of end items required, and then apply Service priorities to determine the initial acquisition quantities of NBC defense equipment.<sup>1</sup> These quantities include active and reserve units, and war reserve requirements. The four Services' acquisition objectives for a joint NBC defense program are independently determined, totaled into an overall DoD figure, and included in appropriate requirements documents.

#### Central Office Analyzes:

- Force Structure Requirements
- Equipment Analysis
- Guidance
- Priority Assessment
- Validates Requirements

Based upon current acquisition guidance for new items being developed and acquired, acquisition programs shall establish logistic support concepts (e.g., two level, three level) early in the program and refine the logistics support concepts through the development process. Life-

<sup>1</sup> This includes the Army's Office of the Deputy Chief of Staff for Operations (ODCSOPS), the Air Force's ACC/CES/ESX, the Navy's Chief of Naval Operations (OPNAV N86), and the Marine Corps Systems Command.

cycle costs shall play a key role in the overall selection process. Support concepts for new and future end items shall provide for cost-effective total life-cycle logistics support.

The fact that all CB defense end items are procured through a common CB Defense Program Objective Memorandum (POM) Strategy allows all four Services to cooperatively plan and execute a joint long-term roadmap to meet future war-fighting requirements. Planning and procuring NBC defense consumables is conducted by each Service individually in line with Title X responsibilities.

### 2.2.2 Consumables

The Services determine the consumable requirements using similar processes. Each

#### **Analysis for Consumables Includes:**

- Threat
- Operational Concept
- Guidance
- Equipment Capabilities

Service's major commands analyze the threat, the future force structure and the operational concepts, then combines this analysis with guidance and equipment capabilities to establish the number of consumables for initial issue stockage and Service sustainment requirements. These quantities include consumables maintained by the units as "initial issue" and those stored by the individual Service (as applicable) to support deployment and initial operations in theater. The

Army and Marine Corps' initial issue stockage levels plus starter stocks include the first 45 and 60-day requirements (respectively) after deployment, while the Air Force allows for 30 days operational supplies. These three Services have a demand-driven process with requirements, demand history and failure factors as inputs. Consumables are stocked and reordered based on historical usage. If there is no annual historical demand, consumables are not ordered for that year. The Navy stockage objective for consumables is 45 or 90 days of projected demand in support of shipboard equipments depending on the mission, and 60 days in support of shore based equipments.

The major difference between purchasing end items and non-medical consumables is that there is no central DoD funding source or central agency that manages a six year readiness and sustainment "roadmap" (such as the CB POM Strategy). Since each commander retains control over their own operations and maintenance (O&M) funds, there is little (if any) joint planning for NBC defense consumables. NBC consumable purchases must compete against other O&M demands such as spare parts, fuel and ammunition required for training and deployment operations.

<b>Unit Initial Operating Supply Requirements</b>	
<b>Service</b>	<b>Days</b>
<b>Army</b>	<b>45</b>
<b>Marine</b>	<b>60</b>
<b>Air Force</b>	<b>30</b>
<b>Navy Ship</b>	<b>45 or 90</b>
<b>Navy Shore</b>	<b>60</b>
<b>Medical (each Service)</b>	<b>30</b>

Individual major commands are responsible for maintaining NBC defense supplies for deployment and operational requirements, while their parent Service maintains starter (initial operating) stocks. These are purchased through the major commands' O&M funds. In most cases, DLA and the Army are responsible for procuring and maintaining NBC defense swing stocks (stocks required and funded by the Services to provide items past the Service's initial issue operating supply requirements—necessary for continuity of operations) for which the other Services have provided O&M funds. Problems arise when agencies fail to identify or forecast the correct quantities, or they fail to arrange for purchasing these items to support deploying forces in a timely manner. It is important to stress that DLA and the Army item managers do not plan requirements nor do they purchase stocks without direct Service funding. This is further discussed in the war reserves section below.

Medical NBC defense programs undertake similar planning, as each Service's major commands analyze the force structure deployment schedule for each MTW. Next, they analyze the requirements for chemical defense materiel (such as nerve agent treatments) and biological defense vaccines and therapeutics. From this analysis, medical defense requirements for the force are prioritized and planned. Currently, each Service plans for 30 days of medical biological defense materiel and initial issue for medical chemical defense materiel for forward deployed and deploying units. Material is stored at a combination of centralized and decentralized storage locations. This allows greater flexibility and availability, storage and replacement cost. The medical community works with the Defense Logistics Agency, the FDA/DOD Shelf-life extension program and industry to manage the necessary quantities required for storage by each Service. These stored quantities are expected to sustain the force until manufacturers are able to produce replacement items.

### 2.2.3 Spare and Repair Parts

#### **Spare & Repair Parts Determination Reviews:**

- Requirements
- Demand History
- Shelf Life

⇒ ***Demand Driven Process***

The Army, Air Force and Marine Corps determine spare and repair parts requirements very similarly. Each Service's major commands analyze the threat, the future force structure, and the operational concepts, then combines this analysis with guidance and equipment capabilities to determine the number of spare and repair parts for initial issue and stockage. Initial issue quantities include spare and repair parts maintained by the units, and those stored by the individual Service (as applicable) to support initial deployment. The Services have a demand-driven process with requirements, demand history and shelf life as inputs. Spare and repair parts are ordered and stocked based on either engineering estimates (for new equipment) or usage profiles. If there is no annual demand, parts are not ordered for that year. The Navy process is also demand-driven. However, shore units stock a 60-day supply of parts on hand, while ships require a 90-day supply. For stocked items, replacement parts are requisitioned when the on-hand quantity reaches a previously established low level. If the approved inventory quantity is one for a given part, or if the part is not stocked at the operational level, then such a part is requisitioned as it is consumed.

If peacetime demand is very low, demand-driven processes run the risk of not being able to support wartime requirements. Currently, all the Services have the capability to designate a part as an insurance item (e.g., a new piece of equipment which has only usage estimates to define stockage requirements, or an item for which there is a training set used in lieu of the actual equipment in peacetime, therefore not requiring a high level of repair of the actual equipment), and to stock this part regardless of demand history. If there is no demand for a given item, annual purchases decrease, creating potential wartime shortages.

Currently, DoD is transferring responsibility for non-repairable parts (non-NBC defense items as well as NBC defense items) over to DLA. Historically, DLA has relied fundamentally on a demand-driven process, but acknowledges the need to protect insurance items. At this time, NBC defense materiel is not a protected category and therefore, many of these items that have a low peacetime demand are not being stocked against wartime requirements.

#### 2.2.4 War Reserve Materiel Requirements

Because of the differing Service practices, it is necessary to understand what each Service considers war reserve materiel. Each Service differs as to how their units deploy, what materiel their units have at deployment, how long that quantity of materiel is expected to last and how their units sustain themselves in theater. Also, not all units enter the theater at or near day one of a contingency; only a small segment of the CINC's forces will enter into theater within the first 30 days.

Although planning for the MTWs include deploying forces in a timed-phased process, the number of units in theater increases as the contingency develops. Some units will be alerted for movement on the first day of deployment, while other units, particularly reserve units, will not be alerted for movement or actual deployment until 60 days or more after the first units enter the theater. This planning demands careful calculation of requirements to ensure the proper war reserve quantities are maintained.

A change over the past few years in the war reserve materiel process is that DLA and DSCP no longer purchase and store war reserve materiel unless specifically funded to do so by the Services. Therefore even though war reserve materiel is purchased and stored by DLA, SBCCOM-Rock Island, and DSCP, it is incumbent upon the Services to manage this process through funding and oversight. War reserve materiel is no longer protected in DSCP storage (as it once was), and DLA/DSCP war reserve stocks have dropped considerably below past readiness levels as a result of low Service funds and shelf life expiration. DSCP will store NBC defense

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<sup>2</sup> This policy change is based on a memorandum signed by the Deputy Secretary of Defense on 15 Dec 94, subj: DoDD 3110.6 War Reserve Materiel Policy. This memorandum clarified Section E-5 of that directive to state that, "It will be incumbent upon the requesting Military Service to program, defend, and fund war reserves whether managed by that Service, another Service or the Defense Logistics Agency." Prior to this clarification, DLA/DSCP was authorized to purchase and store NBC defense war reserve materiel without direct Service funding and oversight.

equipment that has been bought by the Services, but its own war reserve (operating) stocks are rapidly being expended. As a result, the Services should not expect DLA/DSCP to purchase or maintain a war reserve outside of Service requirements that have been purchased by Service funds.<sup>2</sup>

Logistics offices at the wholesale level have limited visibility on the state of retail stocks shelf life, item inventory and lot information. Limited manpower and funds, the number of locations where NBC defense equipment resides, and the enormous time and resources it would take to manage this information throughout the Services and DLA has contributed to the problem. Each Service conducts their own periodic top-down queries to determine their retail stores and unit inventories. The Army has initiated the process of changing the RICC codes on non-medical NBC items that have line item numbers (LINs), which compels the units to input asset information into databases. The Army is implementing the Single Stock Fund (SSF) which will provide asset visibility to the wholesale item manager by allowing the manager to track stockage quantities at installation, Direct Support, and other former supply support activities.

An example of a Service process used to handle war reserve materiel is the Army process. The ODCSLOG establishes—through historical usage and contingency modeling—levels required for stockage under the Army Prepositioned Stocks (APS) (the current Army term for war reserve stocks). The ODCSOPS then funds these requirements (to some level, based on competing requirements) using Army Working Capital Funds (AWCF—the new term for DBOF). DLA, SBCCOM-Rock Island, and DSCP use AWCF to purchase and store the materiel for the Army. The APS is then used to resupply Army requirements after initial deployment operating stocks are drawn down. The other Services use similar processes to maintain their war reserve requirements.

#### 2.2.4.1 Active Forces

Each Service has a separate concept for equipping deploying forces. Units need logistics to sustain operations on their own for a specific planned period of time. At the end of this primary deployment period, all Services rely upon war reserve materiel to provide consumables, parts, and replacements for end items destroyed. This war reserve materiel must sustain the force until they attain operational objectives, and consists of starter and swing stocks. Each deploying unit is responsible for maintaining its own initial issue stocks, while their parent Service maintains and ships starter stocks from theater reserves to units as their initial issue is consumed. Swing stocks, planned and purchased by respective Service O&M funds, are stored and maintained by the item manager for that specific item. In the case of NBC defense equipment, DLA or the Army item managers maintain a great majority of the swing stocks.

The current plan is that, after units exhaust initial issue stocks, war reserve materiel consumables, parts and replacements for end items will support force requirements up through 120 days, the planning figure for the length of an MTW. Small quantities of NBC defense end items are stored in war reserve and, in general, do not present a concern. However, large quantities of parts are required to sustain these end items, and significant quantities of consumables are considered war reserve materiel (such as protective ensembles and filters).

In accordance with DoD instructions, Services use starter stocks and swing stocks as war reserve materiel. Both the Army and Marine Corps rely on starter stocks for NBC defense equipment, including those stocks prepositioned on the ground and on ships (e.g., Maritime Prepositioning Ships (MPS) and Norway Air-Landed Marine Expeditionary Brigade (NALMEB)). All the Services rely on swing stocks to provide support beyond their initial deployment stockage levels and interim operational stockage capabilities.

These categories in Table 2.1 (initial issue, starter and swing stocks) reflect days beginning when individual major commands arrive in theater. For example, an Army unit arriving in theater on the 31st day of contingency operations will consume initial issue stocks for day 31-60 and should not require resupply until the 60th day of the contingency operations. Starting at day 61, the unit would be resupplied from starter stocks until day 76 (45 days after entry into theater, at which time resupply would be from swing stocks).

**Table 2.1. Active Forces - Day 0 = Unit Arrives in Theater**

Service	Initial Deployment/Operational Plan		Sustainment Plan*
Army	Initial Issue/CTA Day 0-30	Starter Stocks Day 31-45	DLA/Army Swing Stocks Day 46-120 Day
Navy	Operations Allowances for Shore Units <sup>3</sup> Day 0-60	Operation Allowances for Fleet Units Day 0-90	No Starter Stocks Outside Units
USMC	Initial Issue Day 0-30	Starter Stocks Day 31-60 (MPS and NALMEB)	Navy Must Fund Swing Stocks for Shore Units Day 61-120
Air Force	Initial Issue Day 0-30	No Starter Stocks Outside Units	Navy Must Fund Swing Stocks for Fleet Units Day 91-120
			USMC Must Fund Swing Stocks Day 61-120
			Air Force Must Fund Swing Stocks Day 31-120

\*Note: Services are responsible for sustainment stocks. One option is for the Service to provide DLA/Army the funds to maintain swing stocks.

During peacetime, initial requirements for spare and repair parts are based on engineering estimates. These engineering estimates are developed early in the materiel acquisition process and are refined over time based upon various field exercise data collection and system engineer updates. Frequently, the anticipated wartime consumption is a factored engineering estimate of the peacetime rates. War Reserve Secondary Item (WRSI) requirements (supply classes I, II, III(P), IV, VIII and IX) are based upon the time phased arrival of the force. Specific materiel requirements are calculated based upon the types and densities of weapon and materiel systems deployed as well as the troop densities in support of the MTW.

#### 2.2.4.2 Reserve Forces

<sup>3</sup> Actual duration of supplies depends on the unit, the supplies in question, and priorities of procurement.



Each Service determines what end items are included in war reserve for reserve forces. The Army uses defined operational projects to meet specific CINC, geographical, unique or common-user requirements which may include reserve forces, and are positioned world-wide both ashore and afloat. The Air Force stores most NBC defense equipment with their reserve units. The Navy and Marine Corps store the majority of their end items and consumables necessary for reserve units, as part of their war reserve materiel. Both the Navy and Marines maintain a small allowance in their reserve units for training purposes. They consider the difference between existing training supplies and necessary deployment requirements as war reserve requirements for reserve units, while swing stocks are for sustainability requirements. Differences in the definition of war reserve versus sustainability supplies among the Services cause the potential for misunderstandings in the joint management of logistics.

Reserve units deployed in contingency operations require sustainment when they exhaust their primary deployment inventory. The Navy, Marine Corps and Air Force handle consumables for reserve units similar to end items. The Army, on the other hand, calculates sustainment stocks for Reserve Component forces as a part of the total force to be deployed into theater. No distinction is made with regard to the WRSI requirements for Active or Reserve Components. Since reserve units can be deployed at any time, the status of war reserve materiel to support these forces is a growing concern as our national strategy increasingly relies on reserve forces.

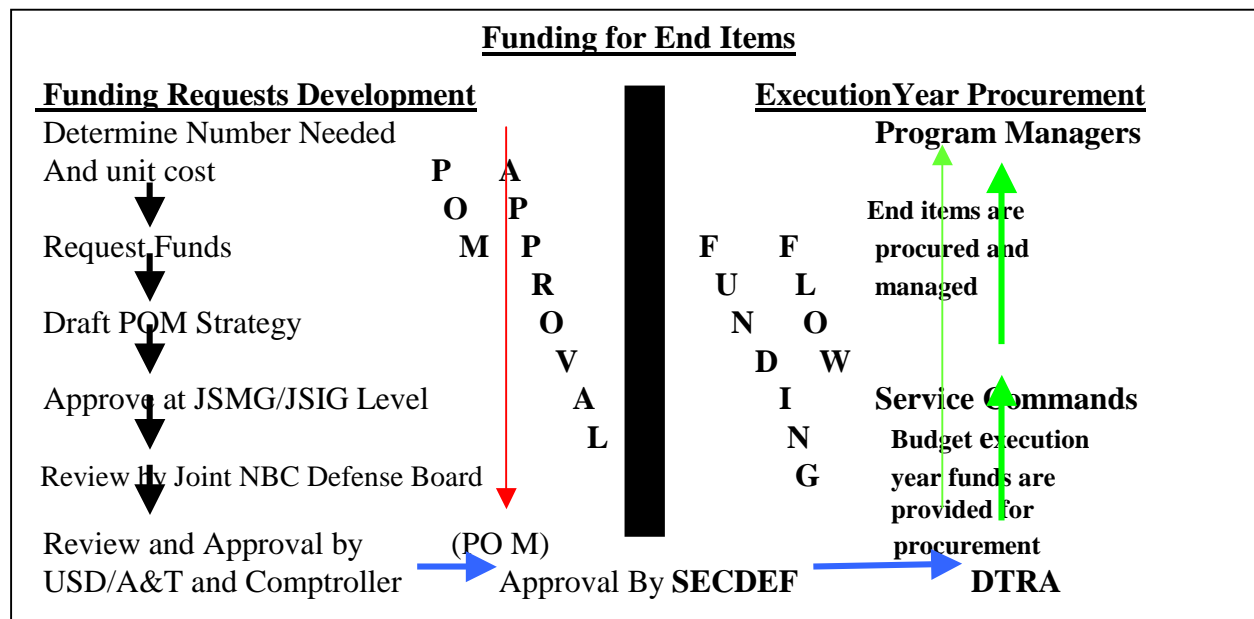
The Navy, Air Force and Marines collocate parts with end items designated for reserve units. These parts are to sustain the end item during the initial deployment phase of that reserve unit. The initial deployment duration is Service-driven, while the latter portion of the war reserve draws from the Army or DLA, as with active forces.

## **2.3 Service Funding for NBC Defense Equipment**

### **2.3.1 End Items**

All four Services determine the number of end items required, and the cost per system, to develop estimates of the initial procurement funds needed. The Services submit individual requirements that are rolled up in the DoD NBC defense program management system. Procurement funding requests make their way through Service procurement channels, until they reach the JSMG/JSIG for the draft POM strategy. The Joint NBC Defense Board completes the POM review, provides the final POM to the OSD CB Defense Steering Committee for initial review and approval. The POM is then forwarded to the Secretary of Defense, through the Under Secretary of Defense for Acquisition and Technology and Comptroller, for final approval. During the funding execution year, the Defense Threat Reduction Agency (DTRA) distributes the funds for implementation of the program in accordance with the Joint NBC Defense Board approved priorities. When executed, research, development and acquisition funds for individual programs are distributed to the lead Service (and certain other agencies), which contracts for the total joint acquisition. Figure 2.1 illustrates this process.

**Figure 2.1 Funding Flow for NBC Defense End Items**

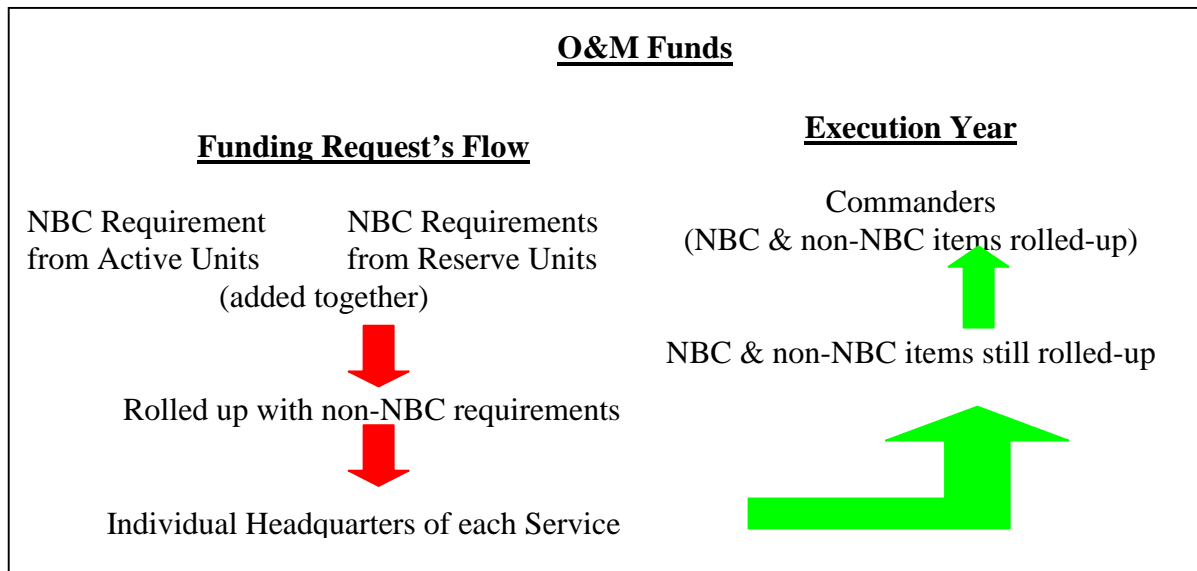


If the end items require support, such as contractor logistics support for maintenance or surveillance and shelf life management, each Service is responsible for requesting their own O&M funds. These O&M funds are prioritized within each Service and become part of the respective Service overall O&M budget. The procurement funds are tied to individual programs, whereas the O&M funds lose identity and can be redistributed based on the overall needs and priorities of that Service.

### 2.3.2 Consumables

Traditionally, all four Services purchase consumables with O&M funds with each Service developing their individual O&M funding requests each year. Typically, each Service starts with the previous year's O&M budget, new defense planning guidance, operational plans and other factors (such as Service personnel end strength) to develop the execution year O&M request. These requests are rolled up with non-NBC defense requests for O&M funds (note: funds are not tied to individual systems). When the O&M budget is distributed to the subordinate Service major commands, the O&M budget contains funds for both NBC and non-NBC defense items (see figure 2.2). In general, the Services cannot commit to future procurements of consumables supporting a given function in as much as each defense function must be balanced against all other functions. Moreover, the process of consumable investment and replenishment is so highly decentralized that any such commitment would be of limited value (other than for theoretical planning discussions).

**Figure 2.2 Funding Flow for NBC Defense Consumables**



Medical consumables are treated differently by each Service. Headquarters, Department of the Army (HQDA) fences funds solely for the purchase of CB defense medical items. These funds are managed by the Army's Office of the Surgeon General (OTSG) who distributes the funds to the U.S. Army Medical Materiel Agency (USAMMA) with specific guidance on what materiel and quantity is to be procured, access obtained, and storage locations.

The Air Force process for purchasing medical consumables differs somewhat from the Army process. Airbases review their manpower deployment documents and update their consumable requirements annually. Funding is provided to each airbase to purchase consumables, and the items are stored on the base where the mobilization requirement exists. If an airbase does not have the capacity to store the items, HQ USAF will position the items at an appropriate location to enable units to be supported, based on their deployment plan and their positioning on the force deployment list.

The Navy CB defense medical consumables requirements are based on personnel levels assigned to each command (i.e., down to ship level). Each command (ship) is provided funding by type major subordinate command who dispenses funds to the subordinate command as OPTAR (operating target budget funds). These funds are not fenced or earmarked for specific items. The individual commanders disburse the funds as necessary to allow operations to take place. Medical consumables for reserve forces are handled in the following manner. Since reserve forces are primarily handled as augmentees to the active naval forces or assigned in wartime to reserve facilities (e.g., fleet reserve hospitals), items to support reserve personnel are built into the allowances to support the reserve facilities the personnel will be assigned to in the event of deployment.

Marine Corps CB medical defense consumable requirements are spelled out in OPNAV instructions, which sets consumable requirements per individual Marine. Funds are then provided in the budget, based on these requirements. The CB defense consumables, which are centralized into 5 locations, may then be purchased with these funds. The Marine Corps is working an initiative to fence funds solely for the purchase of CB defense items, as the Army currently does.

It must be kept in mind that the Army is the only service that fences funds solely for the purchase of CB defense medical consumable items. The Marine Corps is working an initiative to fence funds for the purchase of CB defense medical consumable items. The remaining CB defense medical and non-medical consumable items for all services are not fenced. The decision on how to best use these funds is left to the appropriate level of command, based on each Service's logistics process. In general, the Services will not commit to future procurements of consumables as their CB defense requirements must be balanced against other non-CB defense requirements and the total O&M funding budgeted each year.

### 2.3.3 Parts

Funding of parts is similar to the traditional funding of consumables for all Services. All the Services use O&M funds to replenish the Working Capital Funds, initially used to purchase the parts. The Services use historical data, projected operational tempo (OPTEMPO), and workload to determine funding requirements. If there is a demand for repair, the organic or contractor repair resource needs are determined and the funding request is rolled up with non-NBC items. During the year of execution, O&M funds for parts (obligated and committed) may not match the requested budget. There is no visibility on how individual units commit O&M funds to support NBC defense items.

### 2.3.4 Maintenance

Each Service has the responsibility to program O&M funds necessary to maintain equipment, including those in war reserve and in storage. This includes funds for any depot maintenance required, including parts and labor. NBC defense equipment competes with all other types of non-NBC defense equipment for the same O&M funds. It is up to the individual Service major commands to prioritize which systems receive maintenance first. Historically, NBC defense equipment has been maintained as well as other non-NBC defense equipment.

With the downsizing of the force, there are certain maintenance issues that have become increasingly critical. Lack of funds and/or planning has created problems in specific areas of maintenance, notably in program areas that are already short (such as M8A1 alarms, CAMs, and the NBC Reconnaissance System). Contractor logistics support has become a common option for CB defense programs. Failure to fund depot maintenance or contractor logistics support can impact on unit readiness and sustainment prior to and during deployments. These issues are elaborated in Section 4.

### 2.3.5 War Reserve Funding

War reserve end items are generally purchased with procurement funds. The Services' acquisition objectives include items for war reserve and are calculated when an item is in development. Historically, the Services have purchased war reserve consumables with O&M funds. As noted above, these purchases have generally been dedicated to deployment and initial operating capability. Swing stock purchases, maintained by the Army and DLA, have been historically underfunded, by the Services and in some cases, have become critically low. These shortages have been partially reduced by the current downsizing initiative within DoD. These issues will be further evaluated in Section 3. The net effect of the lack of funding for maintaining war reserve NBC items, however, is to make that stock unusable.

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### **3.0 Readiness and Sustainment Status**

This section outlines our calculations on the Armed Force's readiness and sustainment capability to deploy with their total required quantities of NBC defense equipment. The calculations are matched against the average demands to meet two MTW scenarios as outlined in the current Defense Planning Guidance. Sources for this information include the 2001 Joint Service NBC Defense RDA Plan, the Joint Service NBC Defense Modernization Plan, the Joint Chemical Defense Equipment Consumption Rates (JCHEMRATES) IV study (April 1999) and data call input received from the Services.

#### **3.1 Meeting the Two MTW Requirement**

##### **3.1.1 Service Requirements and On-Hand Status**

The data sheets located at Appendix A outline the FY01 status report of the four Services and DLA's NBC defense programs. Each Service's requirements and on-hand status (and those of DLA) are broken out separately, in addition to a DoD roll-up of requirements and on-hand status. The items evaluated are grouped by commodity area, and are further sorted by end item and consumable status. The total Service requirement identifies the Services' requirements to include peacetime demands such as supplies required for training, equipping active and reserve forces (the total force) and shelf life expiration.

The two Major Theater War number reflects the amount that Service would require for a given number of troops deploying into theater, based on the initial issue and the average consumption rate over a 120-day period. The consumption amount represents the average among four cases:

- high use of chemical attacks under marginal weather conditions
- high use of chemical attacks under favorable weather conditions
- low use of chemical attacks under marginal weather conditions
- low use of chemical attacks under favorable weather conditions.

The JCHEMRATES IV study has undergone validation and was approved by the four Services in March 1999. The results are used as a measure of the current force readiness and sustainment. DLA has no MTW requirements listed, as they do not plan war reserve requirements for the Services. These JCHEMRATES numbers are summarized at Appendix B.

The on-hand stockage status represents the total quantity that each respective Service holds at wholesale and retail levels up to and including all contracts for equipment placed in FY00. For the purposes of estimating funding shortfalls, the Services' projected on-hand quantities at FY07 were measured against their respective average MTW requirements. In the case of end items, the Services have outlined their seven-year procurement plans, which are adjusted annually. In the case of consumables, each Service makes their purchases on an annual basis, which in general tend to replace peacetime consumption such as training and shelf life expirations.

Starting with the FY00 Logistics Support Plan, the two MTW requirement for consumables was increased to include the initial issue along with the consumption rate provided by JCHEMRATES. This decision was made to provide for some inventory to remain after 120 days, thus enhancing our readiness if another conflict ensues.

**Two MTW Requirement for Consumables**

Previous definition: equal to the greater of JCHEMRATES Initial Issue **or** Consumption  
⇒ No inventory remains after 120 days

New definition: equal to JCHEMRATES Initial Issue **plus** Consumption

⇒ Some inventory remains after 120 days

*Readiness for the next conflict is enhanced*

Each commodity area has a set of charts associated with the subject in the appendices of this study (Appendices C through G). The charts illustrate the FY00-10 estimated stockages, the total Service requirements and the average JCHEMRATES MTW requirements (averaged between high use scenarios and low use scenarios). End items and those consumables that were not evaluated by the JCHEMRATES study have a Service-generated MTW requirement that represents the estimated wartime requirement (rather than a JCHEMRATES-generated number). They also summarize the costs to each Service associated with filling any shortfalls and identify industrial base issues. The program charts have an example guide at the front of each appendix.

### 3.1.2 Methodology

To define a shortfall in the DoD readiness and sustainment status, we made several assumptions. In relation to end item calculations, we examined all end items and consumables that were fielded or in development and to be fielded in the short-term (prior to FY07). We limited our funding calculations to counting shortages of end items/consumables that were fielded or in production as of FY00. There are a number of new CB defense items that are being produced between FY01-FY07. We have discussed the status of these items in the following sections and program charts, since a few are directly replacing or augmenting currently fielded programs. Specifically, the M21/22 Modular Decon System's numbers were included with the M12 Decon System, and the Antidote Treatment, Nerve Agent Autoinjector numbers were included with the Nerve Agent Antidote Kit (NAAK). Similarly, the JSLIST MULO and JSLIST Improved CP Gloves are included in the BVO/GVO and 25-mil butyl rubber glove assessments. The other fifteen new items entering the inventory are not replacing previous items but are included for discussion of near-term to-be-fielded equipment.

These calculations resulted in annual quantities for fielded end items and consumables, to include those in production, which were measured against the JCHEMRATES IV study's two MTW average requirements. There were several end items and consumables that did not have a JCHEMRATES two MTW requirement (because the CAA study did not include them). In these cases, we accepted the respective Services' estimate of their two MTW requirements. Additionally, two MTW requirements for items described in Appendix H of the 2001 Joint Service NBC Defense RDA Plan were used in the analyses since those requirements were arrived at by consensus of the Services and the Joint NBC Defense Board. If a shortage existed, we



multiplied that against the unit cost and determined an overall funding shortfall for each item. These numbers are reflected in the tables below.

### 3.1.3 Funding Shortfalls:

Using the Service-approved April 1999 JCHEMRATES IV study to determine the average two MTW requirement, the DoD NBC defense program has the following shortfalls (see Table 3.1). As mentioned previously, we did not duplicate funding shortfalls for items already addressed by the CB Defense POM Strategy.

**Table 3.1 DoD NBC Defense Program Shortfalls in Fielded Equipment – FY07 Status (Avg MTW Rqmts)**

#### End Items (Jointly Funded)

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	33	7	94.4
Individual Protection	13	8	88.9
Collective Protection	5	1	14.6
Decontamination	6	2	34.9
Medical	1	1	2.9
<b>TOTAL</b>	<b>58</b>	<b>19</b>	<b>\$235.7 M</b>

#### Consumables (Service O&M Funded)

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	11	9	15.2
Individual Protection	39	18	623.3
Collective Protection	7	7	33.8
Decontamination	10	5	106.2
Medical	12	7	392.8
<b>TOTAL</b>	<b>79</b>	<b>46</b>	<b>\$1171.3 M</b>

#### Funding Shortfalls by Service

Service	End Items - jointly funded (\$ millions)	Consumables – Service funded (\$ millions)	Total Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Army	70.6	782.2	852.8
Air Force	100.5	131.4	232.0
Navy	31.3	184.8	216.1
Marine Corps	33.3	72.8	106.1
<b>TOTAL</b>	<b>\$235.7 M</b>	<b>\$1171.3 M</b>	<b>\$1407.0 M</b>

In order to define risk, this study borrows from definitions established from past Annual Reports to Congress. “Risk” is defined as the probability that a shortage in the two MTW wartime requirement would exist that would severely impact DoD’s capability to respond to a contingency. Shortages were calculated by comparing average MTW requirements to on-hand quantities. Low risk was assessed if less than a 15 percent shortage existed (or at least 85 percent of the two MTW wartime requirement was currently on-hand in Service inventories). Moderate risk was assessed if a 16–30 percent shortage in the wartime requirement existed (or the percentage of the wartime requirement of on-hand quantities is between 70–84 percent). An item was assessed as being at high risk if the quantity on-hand is less than 70 percent of the two MTW wartime requirement.

#### **RISK ASSESSMENT:**

<b>Low –</b>	Services have at least 85 percent of wartime requirement on-hand to support two nearly simultaneous major theater wars
<b>Moderate –</b>	Services have between 70 to 84 percent of wartime requirement on-hand to support two nearly simultaneous major theater wars
<b>High –</b>	Services have less than 70 percent of wartime requirement on-hand to support two nearly simultaneous major theater wars

The following risk assessments, based on the data collected from the Services, does not reflect shortages caused by peacetime training or normal wear and tear. Additional purchases may be required to balance annual consumption, unexpected shelf life expirations, and contingency requirements above and beyond the JCHEMRATES scenario parameters.

### **3.2 Contamination Avoidance Commodity Area**

Contamination avoidance programs generally include equipment that is used to conduct NBC agent reconnaissance, detection, identification and warning and reporting. This area represents approximately half of the annual DoD NBC defense RDT&E budget. Due to recent type-classification of several programs that are intended to modernize contamination avoidance equipment, this area has an unusually high number of developmental programs. Their status is discussed after the end item/consumable analyses. Table 3.2 summarizes the total shortfalls in this commodity area.

#### **3.2.1 End Items**

The Army and Navy radiac programs are generally short of the two MTW scenario average requirements. The Army National Guard still has a large number of obsolete radiacs. The Army has an adequate supply of the AN/VDR-2 which is replacing the older radiacs as they become available in sufficient quantities through the depot system. However, the Army is at high risk with a low inventory of the AN/UDR-13 Pocket Radiac (Chart C-2). The Navy has small quantities of older radiacs still in the inventory, which should be replaced through a modernization program currently underway. The Navy radiac items that show a shortfall represent low risk. The Marine Corps has 72 percent of its AN/PDR-75s as compared to the

MTW requirements (chart C-3), representing a moderate risk. The Marine Corps has 76 percent of its AN/VDR-2 inventory on hand.

The combined total of chemical agent detection systems was at low risk in FY00 and this trend continues in FY01 as the M22 Automatic Chemical Agent/Detector (ACADA) is fielded in sufficient quantities to supplement the M8A1 Automatic Chemical Agent Alarm (chart C-24). The Navy and Air Force are at high risk in relation to the CAM/ICAM. Although the quantities on chart C-31 indicate a nearly complete fill of chemical agent monitors for the Marine Corps, 61% of that total represents chemical agent monitors that are currently designated unserviceable.

Projected numbers of the Biological Integrated Detection System (BIDS) will be sufficient as measured against the average MTW requirements with the introduction of the BIDS JPBDS Platform in FY01 (chart C-14). However, the viability of the older NDI BIDS systems may become an issue as the production base for many of their components no longer exists. Funds have not been programmed to upgrade the NDI systems until FY06. This may create shortfalls in the second MTW, as early as FY02. Quantities of the Long Range Biological Standoff Detection System (LR-BSDS) fall short of the two MTW requirement even after the Counter Proliferation (CP) LR-BSDS is fielded (chart C-17).

The Army and Marine Corps projected procurements of the M21 Remote Sensing Chemical Agent Alarm (RSCAAL) are in the moderate and high risk categories, respectively (chart C-36). Navy procurements of the AN/KAS-1 CW Directional Detector meet the MTW requirement (chart C-35). By FY07, sufficient M93 Fox Vehicles will have undergone Block I conversions for the M93A1 NBCRS to meet its requirements (chart C-40). The M93A1 adds an improved mass spectrometer sampling system along with stand-off chemical vapor detection. Several units continue to use trained reconnaissance personnel in HMMWVs and APCs, thus moderating this risk as continued fielding and developmental systems enter the inventory.

### 3.2.2 Consumables

Traditional consumables in this commodity area include M8 and M9 detection paper, M256A1 detector kits, M272 water test kits and batteries for the ACADA and ICAM. The Army, Navy, and Marine Corps are short quantities of M8 paper (chart C-18), but Air Force excesses could help compensate the shortfall. Reported quantities of M9 paper have dropped to critically low quantities for the Army, Navy and Marine Corps (chart C-19). M256A1 kits are adequate for the Army, Air Force and Navy (chart C-21); the Marine Corps has reported shortages in the high risk category. The Marine Corps are at high risk for M272 water test kits (chart C-22). All Services report a severe shortage of ICAM batteries (chart C-32) but this is more likely an indication of a lack of visibility for this item, which can be also be used for mask blowers. Similarly, the Air Force and Marine Corps report shortages of ACADA batteries (chart C-25) which can be used in radios, although the Marine Corps has included two rechargeable batteries, charger and adapter with its limited number of ACADAs. All these items' risk levels could be improved quickly with committed purchases over a few years. M273/M293 filter paddles for the M8A1 alarm are high risk for the Army (chart C-27).

**Table 3.2 Contamination Avoidance Commodity Area FY07 Status (Avg MTW Rqmts)**

<b>Service</b>	<b>End Items (Joint Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>	<b>Consumables (Service Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>
Army	AN/UDR-13 (C-2) CAM/ICAM (C-31) M21 RSCAAL (C-36)	\$16.98 20.56 9.71	M8 Det Paper (C-18) M9 Det Paper (C-19) M273/M293 (C-27) BA-5800 (C-32)	\$0.57 1.99 1.27 0.80
<b>TOTAL</b>		<b>\$47.3 M</b>		<b>\$4.6 M</b>
Air Force	ACADA (C-24) CAM/ICAM (C-31)	\$8.17 3.49	M9 Det Paper (C-19) BA-5590 (C-25) BA-5800 (C-32)	\$0.35 3.45 1.21
<b>TOTAL</b>		<b>\$11.7 M</b>		<b>\$5.0 M</b>
Navy	AN/PDR-43 (C-7) AN/PDR-65 (C-9) CP-95 (C-10) PP-4276/PD (C-11) ACADA (C-24) CAM/ICAM (C-31)	\$22.94 0.19 0.28 0.02 1.95 2.98	M8 Det Paper (C-18) M9 Det Paper (C-19)	\$0.03 0.31
<b>TOTAL</b>		<b>\$28.4 M</b>		<b>\$0.3 M</b>
Marine Corps	AN/PDR-75 (C-3) ACADA (C-24) CAM (C-31) M21 RSCAAL (C-36)	\$1.00 0.38 0.05 5.67	M8 Det Paper (C-18) M9 Det Paper (C-19) M256A1 (C-21) M272 Kit (C-22) BA-5590 (C-25) BA-5800 (C-32)	\$0.25 1.41 1.36 0.14 1.53 0.50
<b>TOTAL</b>		<b>\$7.1 M</b>		<b>\$5.2 M</b>
<b>TOTALS</b>		<b>\$94.4 M</b>		<b>\$15.2 M</b>

### 3.2.3 Developmental Items

There are eight developmental items in the contamination avoidance area that are scheduled to join the DoD inventory prior to the end of FY07. As these systems join the inventory, they will significantly improve the force's ability to detect, map and communicate the threat across the battlespace. Additional details on each system are available in the Joint Service NBC Defense RDA Plan.

The Joint Biological Point Detection System (JBPDS) will allow for a common point biological detection capability for all Services. This system is not expected to initiate procurement until FY01-02 and continues through the POM period. The Joint Chemical Agent Detector (JCAD) is not expecting procurement funding until FY03, and will then begin replacing automatic point chemical detectors. Joint Warning And Reporting Network (JWARN), which will provide real-time operational capability for the joint force for reporting, analyzing and disseminating NBC agent detection, identification, location and warning information, is projected to not meet its requirements before FY07.

Several stand-off detectors, to include Artemis/Joint Service Warning Identification LIDAR Detector (JSWILD), the Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD) and the Joint Biological Standoff Detection System (JBSDS) will not be fully fielded during this POM period. The earliest planned procurement funding for any of these systems will not be until after FY02. The two variants of the Joint Services Lightweight NBCRS (HMMWV and LAV) begin fielding in FY01 and will approach complete fill by FY07.

### **3.3 Individual Protection Commodity Area**

Individual protection equipment is designed to protect against all known CB threat agents. Past Service-unique requirements led to Service-specific procurements and some duplication in capability resulting in the procurement of six different chemical protective suits and six different masks. This has caused difficulties in meeting current needs and exacerbated logistics planning. Fielding of the M40/42 protective masks, JSLIST protective suits and the MULO boot has begun to resolve many of these past difficulties. In the far term, a Joint Service General Purpose Mask (JSGPM) is planned. Table 3.3 (located at the end of section 3.3) summarizes the total shortfalls in this commodity area.

#### **3.3.1 Protective Ensembles (Consumables)**

The Services have been buying the Joint Services Lightweight Integrated Suit Technology (JSLIST) suits as a replacement for the BDO and other chemical protective suits. Contracts placed for the JSLIST program have begun delivery and will increase to approximately 300,000 suits per year. As such, the protective suits should be viewed as a system with the older suits providing readiness stocks until the end of their service life. We approximated the number of legacy (BDO, Saratoga, and OG Mark 3) suits still within service life with the aid of the Marine Corps briefing to the JNBCDB on 23 Feb 01 regarding JSLIST Production Allocation. The year-by-year status of protective suits, added to the number of JSLIST suits purchased by that year was matched against the total requirements (Chart D-1). Supplemented by BDOs, Saratogas, and OG Mark 3 Suits, there are not sufficient protective suits by FY07. Between FY01 and FY07, the quantities of JSLIST, BDOs, Saratogas, and OG Mark 3s are projected to fall short of the MTW requirement as the service life of older protective suits expires in large quantities. Beginning in FY06, planned acquisitions of the Joint Chemical Ensemble will begin a trend toward meeting future requirements.

The Battle Dress Overgarment (BDO) is reaching its maximum extended shelf life limit (fourteen years), and the Services plan no new production. There are no companies currently manufacturing the BDO. Additionally, quantities of BDOs were removed from inventory when surveillance testing indicated defects. As a result, the Services can no longer rely on BDOs to sufficiently offset shortfalls in protective garments. The Army has sufficient suits on hand in war reserves to sustain its requirements for the near term. The Navy's shortages of CPOs (OG Mark3) has undergone serious shelf life losses and will be out of service in FY05. A small number of Saratoga suits was obtained as an interim corrective measure. The Air Force suffered some shelf life losses, which are being addressed. The Saratoga suit, purchased by DSCP for the Marine

Corps, is also out of production, but current stocks will sustain the Marine Corps until the JSLIST is available in adequate numbers.

Armor crews and aircrews require special protective ensembles to integrate with their weapon systems. Services have sufficient numbers of aircrew suits to meet requirements, given the smaller total requirements for aircrews (as opposed to ground troops). The Air Force's CWU-66/77 (chart D-7) is at high risk compared to MTW requirements. To protect armor crewmen when they exit their vehicles, the Services have developed the Suit Contamination Avoidance Liquid Protection (SCALP). The Army reports a high risk shortage of this suit (chart D-12). Also, the Army's Chemical Protective Undergarment is projected as high risk (chart D-10). Increased procurement would reduce risk in the short term.

The Services have adequate combined stocks of 14- and 25-mil chemical protective gloves on-hand for contingency use (charts D-14, 15). Shortages exist for 7-mil gloves, but thicker gloves are available for less dextrous applications. Recent DoD surveillance tests have validated the protective qualities of the existing butyl rubber glove stocks. An improved glove, such as the planned JSLIST Block 1 Glove Upgrade would help eliminate reliance on these butyl rubber gloves.

Chemical Protective Footwear Covers, also known as the "fishtail" boots, have been out of production several years and will shortly leave the wholesale inventory. The fishtail is the only boot currently authorized for shipboard use, and replacement of normal consumption and the outfitting of new construction Navy ships are being undertaken by the use of excess fishtail boots obtained from other services (chart D-19). The Green/Black Vinyl Overboot (GVO/BVO) is the designated interim chemical protective footwear and will be retained until the JSLIST MULO boots have been fielded to non-shipboard personnel, although the GVO is obsolete. One should view protective footwear as a system with older GVOs and fishtails providing needed protection until the MULO and an improved shipboard boot are available in sufficient quantities. As such, the total DoD inventory of protective footwear is assessed a moderate risk.

### 3.3.2 Eye/Respiratory Protection

#### 3.3.2.1 End Items

The Services continue modernizing their chemical protective mask inventories. Different versions of the protective mask were developed to meet the requirements of different military occupational specialties (e.g., air crew, tank crew, etc.). For the Army, the M40 (for generic use) and M42 (for armor crew members) series masks are replacing the M17 and M25-series masks, respectively. Some Army aviation units are still equipped with the old M24 mask, which will be replaced by the M45 mask. The M43-series mask, designed to be used by Apache equipped units, was in fact issued to all types of aviation units. It is being upgraded by the M48 (Apache). The Army reported adequate supply of M43A1 masks (chart D-36); fielding to Apache units continues. The Army reported adequate supply of M43 Masks (chart D-36); however the product improvement M48 Mask requires some redesign and verification of air worthiness qualification

before fielding can begin. The M48 provides increased protection, improved fit and comfort, and compatibility with most Services' weapons systems' optics and sights.

The MCU-2A/P is designed to meet the needs of the Air Force ground crews and Navy shipboard and shore-based support missions. The number of these masks on hand does not meet the 2 MTW requirement for the Air Force (chart D-33). Present stocks are adequate for the Navy but it is uncertain if sufficient quantities will be available for replenishment if needed. Procurement of these masks should be increased to sustain those Services until the Joint Service General Purpose Mask is fielded (which will also replace the M40/42 masks). The Aircrew Eye/Respiratory Protection (AERP) Mask is specially designed to enable pilots of high performance aircraft to conduct mission in a contaminated environment and is in adequate supply (chart D-38). For the Marine Corps, the M40 and M42 series masks are being replaced by the M40A1 mask. All armor crew members requiring the M42 mask will be issued an adapter kit that will contain: the hose, filter canister sling assembly, and a microphone adapter.

In order to provide complete protection to troops on the contaminated battlefield, particularly from liquid chemical agents, protective hoods and helmet covers are required as part of the warrior's ensemble. The protective hood for the M40 is rated as low risk. The Quick Doff M40A1 protective hood is being replaced by the JSLIST. The MCU-2P hood is at low risk with an abundant inventory. Protective hoods for the M17-series, M24, and M25A1 masks are not a readiness problem, as these masks are leaving the inventory. Overall inventory of the Chemical Protective Helmet Cover puts it at low risk (chart D-21).

Filters and canisters provide the active ingredients that absorb the chemical and biological agents and provide the essential protection required. The C2/C2A1 canister is used with the M40, M42, M43, M45, M48 and MCU-2/P masks. The total number on hand for all of DoD currently exceeds the two MTW requirements in FY07, but a high risk shortage is reported for the Navy (chart D-35). Total quantities of M13A2 filter elements (used in the M17A2 mask) also exceed two MTW requirements. The M10A1 filter canister used on the M24/25 is short of the total service requirement, but these masks will leave the inventory and will not be a readiness problem.

### 3.3.3. Explosive Ordnance Disposal (EOD) protective equipment

In some circumstances, EOD personnel must be protected against the effects of chemical/biological agents in addition to conventional explosives. This requirement stems from the fact that many potentially explosive devices may contain chemical or biological agents. The Air Force has included their stocks for reporting as they have a high visibility mission supporting air base disaster preparedness during conflicts. The Army views EOD as a post-conflict event, and so chose not to report their stocks as war requirements. Seven items of EOD chemical/biological protection were examined. The M-3 Toxicological Agent Protective (TAP) Suit, M-2 Apron, and M3 Cooling Hood, were reported in sufficient overall quantities (charts D-22, D-26, D-27). The remaining EOD accessories, EOD HGU-65P Hood, TAP Bootcover, TAP Gloves, and M3 Cooling Suits were reported to be in short supply (charts D-23, D-24, D-25, D-28).

### 3.3.4 Miscellaneous Equipment

To validate the proper fit of the protective mask the Services have developed the M41 Protective Assessment Test System (PATs). There are sufficient overall quantities of these PATs to meet Service requirements (D-45) although the Air Force reports a high risk shortage. The Protective Mask Communicator, M7 Amplifier provides enhanced voice communication between masked individuals. The Marine Corps, the sole Service using this item, reports very low stocking of its requirement (D-46).

### 3.3.5 Developmental Items

Several aspects of the JSLIST program remain developmental and represent continued efforts to increase the combat effectiveness and comfort of troops as they wear protective ensembles during operations. The high cost of transitioning from the current large stocks of BDOs to the equally large quantities of JSLIST suits required continues to pose a challenge to Service logistics. A gradual transition program, allowing troops to continue using BDOs as the JSLIST stocks grow, should minimize risk.

The AR-5A/P22P2 is designed for naval aviators and limited Air Force use and, although minimal quantities were reported, is scheduled to be fielded over the POM period. Far-term plans for developing a common aviator mask (fixed wing and rotary wing) are further described in the Joint Service RDA Plan under the Joint Service Aviation Mask (JSAM). A Joint Protective Aircrew Ensemble (JPACE) will provide aviators with a modern capability that replaces the impregnated undergarment and CWU-66/77P, using proven JSLIST technology. Both the JSAM and JPACE are expected to begin procurement in the FY04-06 time frame. Far term plans for a Joint Service General Purpose Mask and a Joint Chemical Ensemble will help standardize protective ensembles.

The Navy plans to field a Mask Leakage Tester (JSMLT) such as the TDA-99M and has a requirement for approximately 1000 mask leak testers. This capability will be provided at the unit or maintenance group level, depending on the particular warfare area. Oversight of Navy unit mask leak testing and maintenance practices will be provided by continued mask surveillance testing, conducted by the Joint Service Equipment Surveillance Unit on about 10-15% of each unit's masks. To complement the lead test, the Navy will field a mask fit tester to the unit or maintenance group level. Personnel will be fit tested on initial issue of their mask and at periodic intervals thereafter to ensure proper fit. Planned Maintenance System procedures will be revised to address mask fit and leak test requirements.



**Table 3.3 Individual Protection Commodity Area FY07 Status (Avg MTW Rqmts)**

<b>Service</b>	<b>End Items (Joint Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>	<b>Consumables (Service Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>
Army	M42A2 Mask (D-30) M45 Mask (D-37)	\$0.33 1.42	JSLIST (D-1) CP Undergarm (D-10) SCALP (D-12) 7-mil Gloves (D-13) 14-mil Gloves (D-14) M40 Second Skin (D-32)	\$273.34 36.92 5.97 0.41 3.35 1.78
<b>TOTAL</b>		<b>\$1.7 M</b>		<b>\$321.8 M</b>
Air Force	MCU-2/P (D-33) AR-5A/P22P2 (D-39) M41 PATS (D-45) Cloth Test Kit (D-47)	\$10.87 69.61 5.48 0.001	JSLIST (D-1) CWU-66/77P (D-7) Aircrew Cape (D-8) 7-mil Gloves (D-13) 14-mil Gloves (D-14) Glove Inserts (D-16) Disp Foot Cover (D-18) EOD M-3 TAP (D-22) EOD TAP accessories (D-25 to D-28)	\$89.76 32.42 0.04 2.58 1.15 0.08 0.29 0.08 0.04
<b>TOTAL</b>		<b>\$86.0 M</b>		<b>\$126.4 M</b>
Navy	No shortages	\$0.0	JSLIST (D-1) 25-mil Gloves (D-15) Glove Inserts (D-16) Disp Foot Cover (D-18) CP Foot Cover (D-19) CP Socks (D-20) CP Helmet Cover (D-21) MCU-2/P Hood (D-34) C2/C2A1 Canister (D-35)	\$115.74 1.64 0.04 0.96 1.58 0.01 0.001 0.02 8.52
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$128.5 M</b>
Marine Corps	M41 PATS (D-45) Mask Comm. Adapter (D-46)	\$0.18 0.98	JSLIST (D-1) M40 Hood (D-31) M40 Second Skin (D-32)	\$41.32 4.68 0.61
<b>TOTAL</b>		<b>\$1.2 M</b>		<b>\$46.6 M</b>
<b>TOTALS</b>		<b>\$88.9 M</b>		<b>\$623.3 M</b>

### 3.4 Collective Protection Commodity Area

There are two general categories of collective protection: stand-alone shelters and integrated systems. Integrated collective protection equipment is component equipment designed to provide protection against CB agents through the use of filtered air under positive pressure to a variety of facilities, vans, vehicles, aircraft and ships. Filters for these integrated collective protection systems are in critical supply due to low historical peacetime demand and low production quantities. The increased emphasis on individual protection and contamination avoidance programs continues to detract from focus in this area. The entire sector remains at risk, although all Services have taken actions to shore up immediate vulnerabilities. Table 3.4 (located at the end of section 3.4) summarizes total shortfalls in the commodity area.

#### 3.4.1 End Items

In the near term, the M51 shelter will be replaced by the new Chemical and Biological Protective Shelter (CBPS). All Army M51 shelters have been coded as unserviceable. The CBPS is presently in production with only limited fielding during FY01. Current plans project approximately half the MTW requirement fielded by FY07 (see chart E-1). Planned procurements through FY10 may reduce the risk.

Both Army and Air Force field hospitals are being integrated with environmentally controlled collective protection. The Army's Chemically Protected Deployable Medical Systems (CP DEPMEDS) and the Air Force's Chemically Hardened Air Transportable Hospital (CHATH) achieve collective protection through the integration of the M28 Simplified CPE, chemically protected air conditioner, heaters, water distribution and latrine and alarm systems. The M28 Simplified CPE is in production and a pre-planned product improvement will provide interface to environmental control units. However, M28 components produced will not be enough to field the full requirement of complete hospitals as originally planned. The effort to complete development and production of chemically protected latrine and water distribution systems and alarms remains unfunded.

The M20-series Simplified CPEs are used to provide a contamination-free, environmentally controlled work space for Echelon I and II forward area medical treatment facilities. There are some units that may deploy into high threat regions that will not be equipped with M20 shelters. Low reported quantities leads to an assessment as high risk (chart E-2). Current policy is that the M20/M20A1 Simplified CPE is a free issue item with no requirement to stock other than spares replenishment. The Marine Corps has stored limited quantities of the Portable Collective Protection Shelter (PCPS) which are being used for training purposes. The M20A1 SCPE is by default the only modern CP stand-alone shelter outside of the medical community currently in the inventory.

The Services have continued to improve integrated collective protection systems in armored vehicles and vans. All modern armored vehicles and armored vehicles in development have either filtered air systems, hybrid collective protection or full collective protection systems

designed into their chaises. Notable progress has been made in providing shipboard collective protection. The Navy now includes the Collective Protection System (CPS) on selected spaces of all new construction ships. Presently, most Naval ships that have close-in support roles (including amphibious ships, gunfire support combatants, and new logistics support ships) now contain significant CPS capabilities.

### 3.4.2 Consumables

Collective protection filters for integrated systems (such as armored vehicles, ships and planes) continue to suffer from low stocks. Most filters fall short of the average requirements of the JCHEMRATES IV study, including the M12A2 filter, the M13-series filter, the M18 and M19 filters, and the M48 filter. Of more concern, this area has traditionally suffered from low historical demand, leading to shortages during actual contingencies. While the Services have been proactive in selecting more capable industrial sources, procurement and storage of these filters in numbers that will eventually meet MTW requirements are still in the early stages. For instance, SBCCOM has recently signed a long term procurement agreement with Hunter Protective Products, a manufacturer of numerous filter items. Until O&M funding catches up with the requirement, stocks of filters (in particular those associated with the M13 and M14 Gas Particulate Filter Units) remain at low levels.

The Navy received funding and approval (as a result of the QDR) for substantial installation of CPS capability on board large amphibious ships, which began in FY00. Aimed at protecting command and control spaces, the large medical facilities, and rest and relief areas of these ships, the Ship CPS Backfit program will significantly improve the capability to maintain mission capability in a CB-threat environment. The impact on the logistics system will be noted primarily in an increased demand for the 200 CFM filter. As planning for the backfit program matures, the Navy will submit revised supply support request documentation to the Army Inventory Control Point responsible for inventory management of this item.

### 3.4.3 Developmental Items

Developmental efforts in this area tend to concentrate on developing more efficient filters and power systems that can easily be integrated into major defense systems. Current inventory and future procurement plans for the CBPS will not meet 50 percent of the total MTW average requirements prior to FY07. The Joint Transportable Collective Protection Shelter (JTCOPS) is scheduled to provide modular shelter accessible from vehicles, beginning in FY06. The Services have also initiated a Joint Collective Protection Equipment (JCPE) program, which is expected to field products in FY01. JCPE will provide needed improvements and cost-saving standardization of currently fielded equipment, while providing the means to directly insert advanced filter and materiel technologies into the field as they become available.

**Table 3.4 Collective Protection Commodity Area FY07 Status (Avg MTW Rqmts)**

Service	End Items (Joint Funded)	Total Funding Shortfalls (\$ millions)	Consumables (Service Funded)	Total Funding Shortfalls (\$ millions)
Army	M20A1 SCPE (E-2)	\$14.59	M12A2 Filter (E-4) M13 Filter (E-5) M18A1 Filter (E-6) M19 Filter (E-7)	\$0.49 1.03 8.48 2.80
<b>TOTAL</b>		<b>\$14.6 M</b>		<b>\$12.8 M</b>
Air Force	No shortages	\$0.0	M48A1 Filter (E-8)	\$0.01
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$0.01 M</b>
Navy	No shortages	\$0.0	M48A1 Filter (E-8) Filter Set M59/M56 (E-9) Ship CPE Filter (E-10)	\$0.51 18.44 0.28
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$19.2 M</b>
Marine Corps	No shortages	\$0.0	M12A2 Filter (E-4) M13 Filter (E-5) M18A1 Filter (E-6) M19 Filter (E-7) M48A1 Filter (E-8)	\$0.10 0.16 0.64 0.13 0.73
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$1.8 M</b>
<b>TOTALS</b>		<b>\$14.6 M</b>		<b>\$33.8 M</b>

### 3.5 Decontamination Commodity Area

Current decontaminants are highly effective against all CB agents, but most present environmental hazards and are manpower intensive. The Services are attempting to find environmentally safe decontaminants, which are less labor intensive and less reliant on water sources. Until then, the Services will rely on existing stocks of DS-2, STB, calcium and sodium hypochlorite, and dry sorbent powder. There are no current decontaminants for sensitive equipment such as communications or avionics. Table 3.5 (located at the end of section 3.5) summarizes the total shortfalls in this commodity area.

#### 3.5.1 End Items

Basic soldier skills for decontamination of vehicles and crew-served weapons rely on the M11 Decontamination Apparatus, Portable (DAP) and M13 DAP. The M295 kit performs immediate decontamination on crew-served weapons. The Army uses its older 1½ quart M11 DAPs to augment quantities of the 14-liter M13 DAPs. Both the M11 and M13 are assessed as posing low risk for the Army. However, there are insufficient quantities of the M13 DAP as measured against the MTW requirements for the Marine Corps (chart F-4).

The M17-series Lightweight Decontamination System (LDS) is used to provide operational equipment decontamination in many battalion-level units and dual-purpose (smoke/decontamination) chemical companies. It is assessed as low risk in general across the Services (see chart F-8), but higher risk shortages exist for the Navy and Marine Corps. There is still a large mix of different models in the inventory, forcing the Services to retain a large number of differing spare parts to maintain the different models. Overall, this risk should drop as more systems are produced and the older models are upgraded or replaced. The Marine Corps is upgrading all of their LDS to the diesel engine version, and the Air Force is replacing its A/E32U systems with the M17-series LDS.

In the Army, the M12A1 Power-Driven Decontamination Apparatus (PDDA) and the M17A3 LDS are the primary pieces of equipment used to decontaminate vehicles, crew-served equipment and large areas of terrain. The M12A1 is assessed as moderate risk. Although the quantities on-hand of the M12A1 would normally result in a low risk assessment, the maintenance requirements, due to the age of this item, limit its full utilization. The M21/M22 Modular Decontamination System will displace over 400 M12A1 PDDAs over the POM period, resulting in a high-low mix of technology. Eventually, the on-hand quantities of the M21/M22 MDS alone should satisfy the two MTW requirement. Additionally, the Marine Corps is replacing their M12A1 PDDAs with the M17-series LDS.

### 3.5.2 Consumables

The shelf life of the M258A1 Skin Decontaminating Kit has expired, thus it is entirely replaced by the M291 Skin Decontamination Kit. By the JCHEMRATES estimates, there are adequate numbers of skin decon kits being procured by the services (chart F-9), however, uncertainties surrounding the exact quantities of kits among the Services will be re-visited in the future.

The M295 Individual Equipment Decontamination Kit is currently in limited production with True Tech, Inc. The planned production of the M295 Decontamination Kit over the POM period should allow the Services to meet their goals, resulting in a low risk assessment in FY07 (chart F-10).

Rohm & Haas, Co., the sole supplier of the resin used in both decon kits, sold the mixing and packaging equipment they used to manufacture the M291 Decontamination Kit. Pine Bluff Arsenal, Arkansas, set up a production line and began to manufacture the M291 Kit in October 1996. SBCCOM is buying the remaining Rohm & Haas inventory of a proprietary XE-555 resin component, which, when blended with two non-proprietary resins, will sustain production until FY07. True Tech Inc. is blending the components to make the XE-555 resin. Alternatives to producing a kit that does not use the XE-555 resin are being studied. There are a number of options being explored to retain this “at risk” technology.

While less hazardous replacement decontaminants are being developed, the quantities and packaging of current decontaminants present potential risk. The overall stockage of STB meets average MTW requirements. Any future shortages in sodium or calcium hypochlorite can be

made up by the industrial base, using commercially available alternatives. Continued monitoring is recommended.

A dramatic increase in the MTW requirements for bulk DS-2 were identified as the result of JCHEMRATES IV calculations relating to the need to decontaminate combat and combat support vehicles, to include light support vehicles. The data used in the April 1999 scenarios greatly increased the light support equipment for some of the units, as compared to earlier JCHEMRATES iterations. The DS-2 5-GAL formula was calculated using light, medium, and heavy support equipment. The DS-2 1-1/3 QT formula was calculated for the tanks, infantry fighting vehicles, artillery, and other tracked vehicles. The Logistics Support Team IPT asserted that the usage outlined in the JCHEMRATES III calculation was more realistic, as it did not include thorough decontamination of as many vehicles. Therefore, the IPT voted to use the JCHEMRATES III requirements for DS-2, pending future analysis of this issue.

Sufficient quantities of bulk DS-2 are projected for current contingency requirements (chart F-11) while quantities of containers of DS-2 (1 1/3 QT and M13 Can) are far below the MTW requirements (see charts F-2 and F-5). The shortage of DS-2 is exacerbated by the deterioration of stocks at Seneca Army Depot. Those stocks have undergone surveillance testing to determine the available quantities that are still chemically viable and able to be dispensed through the M11 and M13. In total, about 1.8 million gallons of DS-2 were found to be viable. As a result, stocks of DS-2 are being released for contingency use only. Nitrogen cylinders (associated with the M11 DAP) are also seen as a high risk with critically low reported quantities (chart F-3).

**Table 3.5 Decontamination Commodity Area FY07 Status (Avg MTW Rqmts)**

Service	End Items (Joint Funded)	Total Funding Shortfalls (\$ millions)	Consumables (Service Funded)	Total Funding Shortfalls (\$ millions)
Army	M17 Series LDS (F-8)	\$7.03	DS-2, 1 1/3 qt (F-2) Nitro. Cylinders (F-3) DS-2, M13 Can (F-5) STB (F-7) M295 Decon Kit (F-10)	\$1.44 8.21 52.26 0.55 32.0
<b>TOTAL</b>		<b>\$7.0 M</b>		<b>\$94.4 M</b>
Air Force	No shortages	\$0.0	No shortages	\$0.0
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$0.0 M</b>
Navy	M17-series LDS (F-8)	\$2.93	STB (F-7)	\$0.08
<b>TOTAL</b>		<b>\$2.9 M</b>		<b>\$0.1 M</b>
Marine Corps	M13 DAP (F-4) M17-series LDS (F-8)	\$4.45 20.57	DS-2, 1 1/3 qt (F-2) Nitro. Cylinders (F-3)	\$11.55 0.12
<b>TOTAL</b>		<b>\$25.0 M</b>		<b>\$11.7 M</b>
<b>TOTALS</b>		<b>\$ 35.0 M</b>		<b>\$106.2 M</b>

### 3.5.3 Developmental Items

The M21/M22 Modular Decontamination System will replace the M12A1 PDDA and M17A3 LDS in chemical units over the POM period, resulting in a high-low mix of technology until all M12A1 PDDAs are replaced. The Sorbent Decontamination System is planned to take the place of STB and DS-2, supplying a non-corrosive and safer decontaminant for immediate decon of future forces. It is scheduled for type-classification during FY01. Joint Service Fixed Site Decontamination (JSFXD) and Joint Service Sensitive Equipment Decontamination (JSSED) program are also underway to address techniques for decontaminating large areas such as ports and airfields, and sensitive equipment, respectively.

## 3.6 Medical Commodity Area

Medical NBC defense items are used to counteract the effects of exposure to chemical, biological or nuclear agents through pre-treatment, vaccines, or post-treatments. The majority of these items are consumables rather than end items. The evolution of the Joint Vaccine Acquisition Program along with the requirements to use no Investigational New Drugs (IND), (must be FDA approved) on military personnel has made procurement predictions difficult to meet. The LSP will continue to focus on the medical chemical defense materiel which has been procured, but will add the biological and nuclear items as they are approved for procurement. Table 3.6 (located at the end of section 3.6) summarizes the total shortfalls in this commodity area.

### 3.6.1 End Items

The sole medical NBC defense end item considered here is the decontaminable litter. The services are procuring the new decontaminable litter in limited quantities for front line units. This litter allows medical personnel to transport battlefield casualties out of a contaminated area and return the litter to use after decontamination. The Army and Navy will have sufficient quantities to meet MTW requirements, while the Air Force remains at high risk (chart G-7).

However, the services are also relying on the very large stockpile of canvas litters that are one-time use in an NBC contaminated environment. As the supply of canvas litters is depleted, it will be replaced by the new decontaminable nylon litter.

### 3.6.2 Consumables

Current projections for medical chemical and biological defense materiel indicates that sufficient quantities should be on hand through the POM years and presents a low risk, except for tetracycline and ciprofloxacin. Combined quantities of Nerve Agent Antidote Kits (NAAK) with Antidote Treatment Nerve Agent Autoinjector, and Convulsant Antidote Nerve Agent (CANA) support two MTW requirements. The overall inventory of medical CB defense materiel has increased.

The sole supplier to DoD for nerve agent antidote kits is Meridian Medical Technologies

whose manufacturing plant is located in St. Louis, Missouri. The medical chemical production line is being maintained with an industrial base maintenance contract. Although Meridian is a U.S. company, both the atropine and pralidoxime chloride drugs used to fill autoinjectors are obtained from German suppliers. This is not seen as an immediate concern as there are currently enough autoinjectors to meet the DoD requirement. Currently, there are no domestic sources for these drugs.

Antidote Treatment, Nerve Agent, Autoinjector (ATNAA) is the replacement for the Nerve Agent Antidote Kit (MARK 1). The MARK 1 consists of two pieces, atropine and 2-PAM chloride. The new autoinjector is multi-chambered, which will permit the individual service member to inject both atropine and 2-PAM chloride at one time, to counteract nerve agent poisoning. Procurement of this item will begin in FY01.

The FDA has approved the topical skin protectant against surface blisters. Its official name is Skin Exposure Reduction Paste Against Chemical Warfare Agents (SERPACWA). This item is packaged in 80 gram packages and six (6) will be issued to each service member. This item will be packaged and centrally stored during FY01, after the packaging line is FDA approved.

Nerve Agent Pyridostigmine Pretreatment (NAPP) tablets (also known as PB Tablets) are still an Investigational New Drug (IND) for the use as a nerve agent pretreatment. USAMMDA has continued to work with the FDA for approval. Defense Supply Center – Philadelphia (DSCP) is negotiating with ICN Pharmaceuticals to establish a requirements contract for the manufacture of NAPP. Current DoD stocks required to support a two MTW scenario are at high risk for the Army, Navy, and Marine Corps in light of the increased requirements for consumables (chart G-5).

The Patient Chemical Wrap is a one-time use item, made out of BDO material, designed to evacuate a patient after being treated and decontaminated through a contaminated area to the next level of care. The Wrap is similar to a sleeping bag with a clear panel in it so the patient can see out. Some of the wraps have been modified with blowers to be used in hot climates. This item has not been procured since 1991. U.S. Army Medical Materiel Agency (USAMMA) and the Army Medical Department (AMEDD) Center & School are currently assessing several versions of the patient wrap before initiating new procurement of this item.

The Office of the Surgeon General (OTSG) has centrally programmed and funded the Army's Medical Chemical Defense Materiel since 1994. USAMMA has procured, stored, and maintained this materiel for the Army in strategic locations for early deployers and forward deployed forces as Division Ready Brigades (DRB) sets, which support 5,000 personnel each. Materiel for follow-on forces is maintained under an IBMC at Meridian Medical Technologies. The Marine Corps has consolidated its medical defense materiel into five centralized locations. The materiel is issued from one of the centralized locations whenever a Marine Corps element deploys and is returned to the centralized program upon redeployment. The Navy and Air Force still maintain their medical defense materiel in decentralized locations. The visibility of on-hand



assets has improved with the release of the Joint Medical Asset Repository (JMAR). The JMAR is the Class VIII (medical) section of the JTAV.

DoD medical research programs continue to focus on medical countermeasures to protect and deter the use of chemical and biological weapons on U.S. forces. The Joint Program Office for Biological Defense (JPO-BD) has awarded a prime systems contract through the Joint Vaccine Acquisition Program (JVAP) for the development, FDA licensure, storage, and production of vaccines against DoD's identified potential biological warfare agents. Currently, the U.S. total force (active and reserve forces) is being vaccinated against the primary high-threat BW agent, anthrax. The anthrax vaccination program is a three-phase program, starting with the troops serving in—or identified to deploy to—the two high-threat areas where hostile anthrax-use poses the greatest potential danger. Despite controversy and potential shortages of vaccine, the vaccination program will take between seven and eight years to complete for all service members (to include new personnel acquisitions as the program extends over the entire time period).

JPO-BD has assisted the sole domestic supplier of anthrax vaccine to maintain its FDA licensure and transition the production facility to private ownership in FY98. A follow-on contract was also awarded in FY98 to ensure sufficient anthrax vaccine to meet the DoD vaccination program. Other vaccines (or combinations) are currently in various stages of development and testing to protect against other BW agents, as identified in the Chairman of the Joint Chiefs of Staff (CJCS) validated BW threat list. In the area of medical therapeutics, DoD is maintaining a stockpile of antibiotics (e.g., ciprofloxacin, doxycycline, erythromycin, etc.) sufficient to address the treatment needs of potential BW exposures, where such treatment is medically indicated.

### 3.6.3 Developmental Items

Medical research in chemical defense focused on completing efforts to field a reactive topical skin protectant against blister agents, the development of circulating scavengers for nerve agents, and antidotes for blood agents such as hydrogen cyanide. Medical research programs continue to explore medical countermeasures to deter and defeat the use of biological warfare agents against U.S. forces.

**Table 3.6 Medical Commodity Area FY07 Status (Avg MTW Rqmts)**

<b>Service</b>	<b>End Items (Joint Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>	<b>Consumables (Service Funded)</b>	<b>Total Funding Shortfalls (\$ millions)</b>
Army	No shortages	\$0.0	NAAK/ATNAA (G-1) Atropine Auto (G-2) PB Tabs (G-5) Ciproflox (G-9) Ant Cyanide (G-11)	\$25.48 3.93 21.14 279.39 18.62
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$348.6 M</b>
Air Force	Decon Folding Litter (G-7)	\$2.93	No shortages	\$0.0
<b>TOTAL</b>		<b>\$2.9 M</b>		<b>\$0.0 M</b>
Navy	No shortages	\$0.0	Atropine Auto (G-2) 2-PAM Cl (G-3) PB Tabs (G-5) Tetracycline (G-6) Ciproflox (G-9)	\$4.59 10.84 7.52 1.67 12.00
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$36.6 M</b>
Marine Corps	No shortages	\$0.0	2-PAM Cl (G-3) PB Tabs (G-5)	\$2.35 5.26
<b>TOTAL</b>		<b>\$0.0 M</b>		<b>\$7.6 M</b>
<b>TOTALS</b>		<b>\$2.9 M</b>		<b>\$392.8 M</b>

## **4.0 Maintenance Sustainment Funding**

The challenge of the military today is to improve readiness while reducing support costs and to use the money saved to address readiness and sustainment shortfalls. The key to achieving these seemingly contradictory goals is to recognize that the huge sums paid for readiness are driven by a logistics infrastructure and processes that were designed to win the Cold War, not to meet the anticipated conflict of the 21<sup>st</sup> Century with modern logistics processes. The military must dramatically reinvent logistics processes to make these improvements. To accomplish this, the military must build upon the recent logistic successes of the world-class commercial firms and their focus on rapidly and reliably satisfying customer requirements. The objective is to evolve to an integrated, warfighter-driven, secure supply chain through four key initiatives:

- Totally reengineer the logistics processes to improve customer service -- including velocity, accuracy, reliability, and security -- assuring rapid and assured supply at much lower costs;
- Dramatically reduce the in-theatre footprint, via the use of smart weapons, miniaturization, confidence in supply, rapid transportation, highly reliable equipment, reduced fuel consumption, and enhanced field maintenance procedures;
- Downsize the infrastructure - through reduced logistics personnel (military and civilian) along with fewer facilities and inventories -- and aim for a system that efficiently and effectively goes from factory to foxhole; and
- Implement a modern, secure, reliable integrated information system.

Continued improvements in reliability, maintainability, and supportability should decrease support requirements and provide opportunities and challenges to change traditional logistics concepts. For example, improved reliability may result in fewer repair parts, smaller Authorized Stockage Lists (ASL), and reduced maintenance, transportation, storage, and accountability requirements. Improved maintainability should diminish the need for highly specialized skill sets, thus enhancing the feasibility of innovations such as the repair-forward support concept. Collectively, such improvements should result in a well-balanced logistics footprint in the operational Theatre and, more importantly, a more deployable and sustainable fighting force.

Several of these initiatives are evident in the depot maintenance and future maintenance concepts of NBC defense equipment. This section discusses those concepts as they are related to representative equipment items. The section is divided into two main discussions. The first half reviews the Services' current maintenance sustainment challenges. The second half reviews the future maintenance requirements for NBC defense equipment that will be fielded in the next five years. This information is provided to shed visibility on an important but often overlooked facet of logistics, maintenance sustainment of NBC defense equipment.

#### 4.1 Depot Level Maintenance Sustainment for Currently Fielded Items

The majority of NBC defense depot maintenance sustainment funding is executed by the Army, with some exceptions such as the Multi-man Integrated Cooling System (Air Force) and other Service-unique programs such as the Navy's Improved Point Detection System (IPDS). The current plan to fund depot-level repair of NBC defense equipment is based on the past history of repair work required, balanced against the respective Service's priorities. As a result of limited funds, there are some shortfalls, but the overall deficiency is not extreme - at depot level.

##### 4.1.1 Army Depot Maintenance Sustainment Issues

Army NBC depot maintenance includes the following six items covered by this report: M8A1 Automatic Chemical Agent Alarm (CAA), Chemical Agent Monitor (CAM), M21 Remote Sensing Chemical Agent Alarm (RSCAAL), Improved Chemical Agent Monitor (ICAM), the M48 mask, and the M43 mask, until it is replaced by the M48 (Table 4.1). The M48 Apache protective masks were originally scheduled to replace the M43 masks in FY99 but this may not occur until FY02. Each Service has responsibility for repair of their CAM/ICAM; the Army does not anticipate further repairs, thus no funds are programmed. Total required funding for the six listed items during the present POM period is \$2,947K, but at present, there are no funds programmed in the POM period.

**Table 4.1** Army Depot-Level Repair Funds (Required/Funded)

	<b>FY01</b>	<b>FY02</b>	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>FY07</b>	<b>Total</b>	<b>Shortfall</b>
<b>M8A1 CAA</b>	\$147K/ \$0K	\$120K/ \$0K	\$173K/ \$0K	\$59K/ \$0K	\$60K/ \$0K	\$61K/ \$0K	\$62K/ \$0K	\$682K/ \$0K	\$682K
<b>CAM</b>	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K
<b>M21 RSCAAL</b>	\$234K/ \$0K	\$231K/ \$0K	\$247K/ \$0K	\$252K/ \$0K	\$257K/ \$0K	\$262K/ \$0K	\$268K/ \$0K	\$1,751K/ \$0K	\$1,751K
<b>ICAM</b>	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K
<b>M43 Mask</b>	\$58K/ \$0K	\$108K/ \$0K	\$130K/ \$0K	\$106K/ \$0K	\$54K/ \$0K	\$28K/ \$0K	\$0K/ \$0K	\$484K/ \$0K	\$484K
<b>M48 Mask</b>	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$5K/ \$0K	\$5K/ \$0K	\$10K/ \$0K	\$10K/ \$0K	\$30K/ \$0K	\$30K
<b>Total</b>	\$439K/ \$0K	\$459K/ \$0K	\$550K/ \$0K	\$422K/ \$0K	\$376K/ \$0K	\$361K/ \$0K	\$340K/ \$0K	\$2,947K/ \$0K	\$2,947K

During FY98, the U.S. Army initiated an inspection and repair program for the M8A1 Chemical Agent Alarms being returned from the units to Anniston Depot (currently repairs are done at Pine Bluff Arsenal) without serviceability requirements. The Army invested \$400K to determine the serviceability status (A-G, A repairable - G non-reparable) of 3,100 M8A1 CAAs. This investment allowed the Army to expedite the return of 1,600 class, B status items to the field, thereby closing the Army acquisition objective gap between the M22 ACADA and M8A1. The remaining 1,500 M8A1 alarms were returned to SBCCOM Rock Island, Illinois for depot maintenance. The \$730K funding for depot maintenance of the M8A1 during FY99 was sufficient to service 650 alarms. This initiative, in addition to the planned buys of the M22 ACADA, will satisfy 100% of the Army requirements for contingency and training chemical agent detectors.

#### 4.1.2 Air Force Depot Maintenance Sustainment Issues:

Tracking O&M dollars budgeted to support NBC equipment at the depot level is very difficult because the Air Force makes no distinction between NBC and non-NBC funding. According to sources at the Warner Robins Air Logistics Center (WRALC), none of the NBC items managed there require depot level maintenance.

The MCU 2A/P is managed by the WRALC and receives no depot maintenance. The MBU 19/P is managed by 311 HSW/YACN at Brooks Air Force Base. According to the AERP program manager, there is no depot level maintenance for this item. There are, however, aircraft modifications that are required to utilize the AERP. These modifications are funded with AERP NBC program funds.

#### 4.1.3 Navy Depot Maintenance Sustainment Issues:

The Naval Surface Warfare Center, Crane, Indiana, Chemical/Biological Detection Team (Code 805D) provides In-Service Engineering Agent (ISEA) support for a number of systems. Involved with this effort, NSWC Crane ensures that Chem/Bio detection equipment in the fleet is logistically supported with technically accurate documentation, properly provisioned and provided with installation assistance as required. The following tasks are completed to this end:

- Support for engineering and maintenance
- Conduct quality assurance inspections and test support
- Establish a serial control program and allowance management
- Conduct failure analysis as required
- Provide technical support for depot maintenance
- Provide initial outfitting and installation spare parts
- Maintain configuration control of the Technical Data Package
- Provide Engineering Change Proposal analysis and evaluation
- Maintain liaison and coordination with Ships Parts Control Center
- Provide support for the performance of any Ship Alteration Record
- Review technical manuals and provide change pages as necessary
- Provide radioactive material control and tracking

ISEA O&M,N shortfalls and fleet OPTAR shortfalls for system repairs are being addressed internally with OPNAV sponsors.

The Chemical/Biological Detection Facility provides the Fleet and other DoD users with superior life cycle support of NBC detection equipment. The facility includes support for areas of production, operational support, and disposal of systems. The enhanced capabilities provide DoD with support for existing detection equipment as well as new systems that are being developed. The Chem/Bio Detection Facility empowers Crane to continue as a leader in total system support for the dynamic requirements of the military.

The Chemical/Biological Detection Facility opened in FY00 with total construction costs of \$4.1M. The total floor space capacity is 25,000 square feet with 3,900 square feet of engineering and office support; 14,900 square feet for repair, overhaul, demilitarization, system upgrades, acceptance

testing, radioactive material handling, emergency containment room for chemical agents, receiving, staging, and shipping; and 6,200 square feet for maintenance, auxiliary, and administration. The following NBC Defense items expect to be repaired at the new facility:

- Chemical Agent Point Detection System (CAPDS)
- Improved Point Detection System (IPDS)
- Joint Services Light-weight Standoff Chemical Agent Detector (JSLSCAD)
- Improved Chemical Agent Monitor (ICAM)
- Automatic Chemical Agent Detector and Alarm (ACADA)
- Joint Chemical Agent Detector (JCAD)
- Joint Biological Point Detection System (JBPDS)

#### 4.1.4 Marine Corps Depot Maintenance Sustainment Issues:

During FY00, Congress provided funds in the amount of \$3.7 million to support Joint Service Surveillance Programs. The Congressional funds are being used for testing, management and administrative support of the program. The Marine Corps is the lead agency for the Joint NBC Equipment Surveillance Technical Working Group. One of their initiatives is to standardize and implement a joint surveillance program for protective masks. To implement this cost-avoidance practice across all four Services, the Marine Corps chair is requesting \$14 million in funding over six years. More detail on the joint surveillance effort can be found in section 6 (other studies).

The USMC's ten Fox Vehicles are covered under the Army's contractor logistics support maintenance concept. In addition to the Fox vehicles, the Marine Corps execute depot repair for its CAMs, the M41 PATS, M40-series masks, and M17 LDS (see Table 4.2). Funded/unfunded numbers depicted in Table 4.2 for the M41 PATS are based on equipment currently calibrated. However, these calibrated items are expected to expire within the next 12 months. This calibration issue has adversely affected fielding of the M41 PATS. Of the 437 M41 PATS in the Marine inventory, 183 are calibrated, with 254 units requiring calibration at Red Stone Arsenal. The cost per unit is \$350. Calibration of the remaining items requires an intermediate maintenance capability, without laser manipulation, for a total cost of \$138K.

The entire fleet of NBCRS vehicles is maintained under a blanket maintenance concept, which is viewed as a very successful prototype for industry-government cooperative contract support.

A services order contract for a system maintainability and reliability improvement program was awarded to Intellitec of Deland, FL, to refurbish all CAMs in the Marine Corps inventory. This is a 17 month program. Replacement of the drift tube with an improved drift tube will improve reliability. The first work efforts will convert 1800 CAM 1.5 to 2.0 and the existing 800 CAM 2.0 will follow. Intellitec anticipates refurbishing and returning 150 CAMs per month.

The modified engines for the Lightweight Decontamination System will operate on JP-5 and JP-8, without loss of power or RPM. The engine is a one cylinder, two-stroke engine with approximately a 7-pound difference in weight that uses less fuel, and eliminates the requirement to mix oil. A one cylinder, two stroke gasoline engine, currently powers the LDS. However, in accordance with the "one fuel forward" directive, gasoline will no longer be used on the battlefield. During FY99, the Marine

Corps awarded a contract to modify their current gasoline engine of their M17A1/A3 to heavy fuel engines. A contract was awarded to Two Stroke International of Beaufort, SC. The engine modification program satisfies the Marine Corps Heavy Fuel System (MCHFS) one fuel forward requirement. The contract covers (2) two phases. Phase I addresses the requirements for the Marine Corps to provide nine (9) existing M17 LDS to the contractor for interface and prototype testing. Phase II consists of engineering, pre-production qualification testing and logistics (to include any necessary updates to government furnished information). The production of 1444 engines/with modification kits using FY99 and FY00 joint funding will cost \$3,376.05 per modification kit.

**Table 4.2** Marine Depot-Level Repair Funds (Required/Funded)

	<b>FY01</b>	<b>FY02</b>	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>FY07</b>	<b>Total</b>	<b>Shortfall</b>
<b>M41 PATS</b>	\$0K/ \$0K	\$138K/ \$138K	\$0K/ \$0K	\$138K/ \$138K	\$0K/ \$0K	\$138K/ \$138K	\$0K/ \$0K	\$414K/ \$414K	\$0K
<b>M40 Mask</b>	\$2,000K/ \$0K	\$5,076K/ \$0K	\$150K/ \$0K	\$150K/ \$0K	\$150K/ \$0K	\$150K/ \$0K	\$150K/ \$0K	\$7,826K/ \$0K	\$7,826K
<b>CAM/ICAM 1.5 / 2.0</b>	\$1,400K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$1,400K/ \$0K	\$1,400K
<b>M93 NBCRS</b>	Maintained under Army contract							N/A	N/A
<b>M17 Decon Apparatus</b>	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K
<b>M17 MCHF</b>	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$0K/ \$0K	\$160K/ \$0K	\$160K/ \$0K	\$160K/ \$0K	\$480K/ \$0K	\$480K
<b>Total</b>	\$3,400K/ \$0K	\$5,214K/ \$138K	\$150K/ \$0K	\$288K/ \$138K	\$310K/ \$0K	\$448K/ \$138K	\$310K/ \$0K	\$10,120K/ \$414K	\$9,706K

The Marine Corps is performing a Product Improvement Program (PIP) to modify the existing M40/42 series mask. The PIP will be completed in fiscal year 2004. PIP actions include installation of a new nose cup, polycarbonate eye lens, drink tube coupling, and drink tube quick disconnect, banding of the outlet valve housing, and laser etching serial numbers on the mask.

The new components and banding procedure will improve the mask's durability and protective capability requirements established by the Marine Corps and eliminate inadvertent damage to the mask by the unit (i.e. painting a number on the head harness, engraving in the eye lens-retaining ring).

The cost to perform the PIP was estimated at \$11.698M with the Marine Corps having a cost savings of approximately \$10M by performing the rebuild vice buying new modified masks. Currently \$4.924M has been applied to the PIP with a remainder of \$7.076M. It is projected that \$2M will be funded in FY01, which will leave a remainder of \$5.076M to be funded for FY02. If this Program is not fully funded within its scheduled plan the cost will increase due to the wash out rate. I MEF had an average washout rate of 30% during their swap out and it is projected that III MEF may experience a 60% washout rate based on an assessment of assets in May 2000.

## 4.2 Sustainment Cost Drivers for Currently Fielded Items

4.2.1 M93/M93A1/M93A2 NBCRS (see charts C-39/C-40) - The Fox NBCRS contractor logistics support (CLS) contract has been in place since the systems were returned from Operation Desert Storm. There is a total of 120 M93's available for Block I upgrade to M93A1's. The POM

has budgeted to upgrade 88 M93's to M93A1's by the end of FY03. Beginning in FY04, the remaining M93's will begin upgrading to the Block II M93A2.

The Fox Fleet has been supported in the field using Full CLS Supply support and standard army organizational level maintenance and CLS maintenance at DS and above. The unit is responsible for organizational level maintenance. The contractor provides DS/GS and depot level maintenance support. Unit operational readiness rates average approximately 90 percent (CLS maintained this OR since inception). Marine Corps Fox vehicles are maintained under an amendment to the Army contract with the contractor.

General Dynamics Land Systems (GDLS) Division Sterling Heights, Michigan, is the contractor. GDLS maintains a government owned inventory of Fox spare and repair parts under the CLS contract. The parts are warehoused at Anniston Army Depot (contract NICP). Parts required for organizational level maintenance are provided to the unit as a part of the CLS contract. The Contractor Logistics Support MBT now maintains the DS level ASL and PLL. The ASL is tailored to each unit based on demand history. The CLS contract also provides for repair or replacement of assemblies based on economic feasibility (if repair of an item is more than 60% of its replacement cost it will be replaced). For the Marine Corps, the contractor provides support to various Marine Corps sites on a rotational basis.

The CLS contract is based on a calendar year and generally runs from January through January with OMA funding. The CLS contract that ended 31 January 1999 was for \$12.3M. The contract costs for the following years include those for the M93 units that undergo Block I upgrades to the M93A1 (see following table). Note that the cumulative quantity of M93 NBCRS is reduced as they proceed through conversion to M93A1 and M93A2.



### A. NBCRS Block I (see Chart C-40)

Type Classification (MSIII): 6/95

Maintenance Concept: Contractor Logistics Support (CLS)

1<sup>st</sup> Fielding: 10/98

Current Published LSP: 8/96

Special Support Requirements: none

NBCRS, Block I	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$2.2M								
Production Units (per yr) M93A1		13	12	6					31
Running Total Units * M93 M93A1	Currentl y 63 57	50 70	38 82	33 87					33 87
Running Total Production Costs (\$M)**		\$211.2	\$217.5						\$217.5
* M93's modified to M93A1's ** Total Procurement Costs									
Below Depot Repair Parts.		--	--	--	--	--	--	--	--
Depot Maintenance Rqmts.		--	--	--	--	--	--	--	--
Contractor Log Support Rqmts. (\$M per year)		\$13.5	\$13.7	\$13.8	\$14.0	\$14.2	\$14.7	\$15.2	\$99.1
Consumable Rqmts. (\$M per year)		--	--	--	--	--	--	--	--
<b>Total Sustainment Cost Drivers (\$M, sum of above 4)</b>		<b>\$13.5</b>	<b>\$13.7</b>	<b>\$13.8</b>	<b>\$14.0</b>	<b>\$14.2</b>	<b>\$14.7</b>	<b>\$15.2</b>	<b>\$99.1</b>
<b>Total Sustainment Cost Per Unit Per Year</b>	<b>\$0.12M</b>								

### B. NBCRS Block II (see Chart C-40)

Type Classification (MSIII): 10/02

Maintenance Concept: Contractor Logistics Support (CLS)

1<sup>st</sup> Fielding: 2/05

Current Published LSP: Pending

Special Support Requirements: none

NBCRS, Block II	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$2.46M								
Production Units (per yr)				2	17	22	19		60
Running Total Production Units				2	19	41	60		
Running Total Production Costs				\$5,525K	\$29,802K	\$55,202K	\$80,196K	\$81,196K	\$81,196K
Below Depot Repair Parts.				TBD	TBD	TBD	TBD	TBD	TBD
Depot Maintenance Rqmts.				--	--	--			--
Contractor Log Support Rqmts. (per year)				TBD	TBD	TBD	TBD	TBD	TBD
Consumable Rqmts. (per year)									
<b>Total Sustainment Cost Drivers (sum of above 4)</b>				TBD	TBD	TBD	TBD	TBD	TBD
<b>Total Sustainment Cost Per Unit Per Year</b>	<b>TBD</b>								

4.2.2 Biological Integrated Detection System (BIDS) (see chart C-14) - The U.S. Army biological detection capability consists of both standoff and point technologies. Used in combination, these systems improve the Army's overall biological warfare agent detection capabilities. The point detection systems consist of the Non-Developmental Item (NDI) and Pre-Planned Product Improved (P3I) BIDS, M31 and M31A1, respectively. The M31A1 is the follow-on system to the M31, NDI BIDS. The 310<sup>th</sup> Chemical Company, an Army Reserve unit, is a Bio Detection Company that has been equipped with 38 M31 (NDI) BIDS and three NDI LR BSDS. The Army's 100<sup>th</sup> Training Division has received 3 M31 BIDS. Fielding of 38 M31A1 (P3I) BIDS to the 7<sup>th</sup> Chemical Company was achieved in October 1999.

The BIDS is supported by both CLS and Organic Maintenance. The commercial components of the BIDS are supported by CLS at depot support and above. The units have responsibility for all organizational level maintenance and supply of standard military items (i.e., HMMWV, Environmental Control Units, SINCGARS, etc). The CLS concept used for the NDI M31 proved to be economical and effective, and was adopted for the M31A1. A BIDS system that incorporates the JBPDS in its platform is expected to be fielded in FY02, and will also be supported by CLS.

A specified number of spares exist per component that is maintained by CLS for each unit. The unit level repair is done by using on-board spares. If the component cannot be repaired through troubleshooting by the crew, a spare component will be brought forward by the unit maintenance contact team and directly exchanged with the failed component. If a failure occurs to the shelter power distribution system, the unit maintenance will be responsible for evacuation of the system to a safe area for CLS maintenance. The contractor provides DS/GS and above maintenance support to maintain a unit operational readiness rate that averages approximately 90-95 percent.

A single Logistics Support contract was awarded to Brown & Root in October 1999. The contract covers the BIDS NDI and the P3I. Brown & Root maintains the government owned inventory of spare and repair parts, and consumable warstock under the CLS contract. The biodetection units are fielded with and maintain an authorized stockage level of repair parts and consumable warstock. The authorized stockage level is based on previous demand. The warstock for the BIDS, M31 (NDI) and M31A1 (P3I) is centralized at Fort Gillem, GA. The repair parts warstock is maintained at the Nichols Center, Anniston, AL, and Fort Polk, LA. The CLS contract is based on the fiscal year, and is funded with OMA dollars each year.

**Table 4.3** BIDS CLS Funds (Required/Funded)

	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total	Shortfall
<b>BIDS, NDI &amp; P3I</b>	\$1.0M/ \$1.0M	\$1.0M/ \$1.0M	\$1.0M/ \$1.0M	\$1.0M/ \$1.0M	\$1.0M/ \$1.0M	TBD/ TBD	TBD/ TBD	TBD/ TBD	\$5.0M/ \$5.0M	\$0

Requests for additional funds to maintain the BIDS NDI have been made to replace/upgrade critical components that are nearing the end of their service lives.

## 4.3 Research and Development Programs

### 4.3.1 Introduction

This section addresses the maintenance and sustainment funding requirements for specific representative developmental NBC systems. The depot maintenance, contractor logistics support, and consumables cost estimates presented in this section will provide the initial base-line funding requirements. The Commercial Off-The-Shelf environment has brought about significant changes in the manner by which today's systems are planned, acquired and fielded. Acquiring agencies or departments are required to field systems faster, cheaper, and better.

As a requirement in DOD 5000.2, the maintenance philosophy shall be established early in the program, and refined throughout the development process. The identification of the maintenance philosophy (e.g., two level, three level) is imperative to calculating an accurate depot maintenance cost estimate and/or contractor logistics support for each developmental system. With the addition of other cost considerations, e.g., consumable supplies, a more complete maintenance and sustainment cost driver estimate can be calculated.

By identifying the projected maintenance and sustainment costs prior to fielding the NBC detection systems, the item Program Office may begin to interject the appropriate funding request early in the POM process. In determining depot level cost estimates and contractor logistics support, a spares analysis of the system is the most accurate determinant in estimating costs. As the design approaches Preliminary Design Review (PDR), information regarding the failure rates, unit costs, LRUs, of the piece parts should be made available from the contractor. Consumable requirements can also be identified. This information is used to perform spares analyses that will actually produce a sparing list that is used for identifying proper stock levels of parts. This analysis uses information regarding the desired Operational Availability (Ao) of the equipment and then uses unit cost, piece part costs, failure rates, and other determinants to calculate the best utilization of resources and maintain the Ao of the system.

### 4.3.2 Scope

The scope of this analysis is to identify the potential funding requirements related to the maintenance and sustainment of the NBC detection systems that are currently in development and will be fielded prior to FY07. Many of the NBC systems that were assessed for maintenance and sustainment cost estimates were premature in their development and were unable to have detailed cost estimates assigned for budget planning purposes. Developing detailed estimates requires certain information be available on each system to conduct proper budgeting analysis. Relevant data that must be identified for an accurate assessment to be made, which were absent from many developmental NBC systems, include maintenance concepts, stability of the hardware design, consumable requirements, and support data.

Many NBC developmental systems have not yet determined their maintenance philosophy, making a cost estimate too ambiguous to be useful. These developmental systems lack the necessary support data to conduct a spares analysis due to the early stage of the systems in their life cycle. This information should become available as the systems mature. Other NBC developmental systems have

determined that depot level maintenance will not be part of the maintenance concept and will have to be revisited as the designs change, and the cost estimates will have to be updated to reflect new analyses based on better data.

The stability of the hardware design is important to prepare accurate cost estimates for maintenance and sustainment. The stability of the design provides insight into the piece parts that will be used to comprise the system. Many of the NBC developmental systems were not stable in their designs. While some programs have developed engineering model designs (EMD) units, they are typically best suited for “proof-of-concept” and may not reflect the actual production hardware in terms of technology, design and maintenance/logistics/consumables requirements. The actual NBC detection systems will be designed by commercial contractors based on performance specifications, possibly incorporating innovative technologies not reflected in the EMD unit. Therefore, until the system has passed the PDR and critical design review (CDR) milestones, it is very difficult to accurately estimate maintenance and sustainment requirements. Once the design is stable, rough estimates can be made using a percentage of the piece part costs that comprise the system. In the future, more refined estimates for these developmental items should be made in support of Milestone III IPRs.

The specific developmental NBC systems analyzed include:

- Biological Integrated Detection System (BIDS) JBPDS Platform
- Joint Chemical Agent Detector (JCAD)
- Joint Biological Point Detection System (JBPDS) Block I
- Joint Biological Point Detection System (JBPDS) Block II
- Joint Warning and Reporting Network (JWARN)
- Multiple Integrated Chemical Agent Detection (MICAD)
- Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD)
- Lightweight NBC Reconnaissance System (LNBCRS)/Light Armored Vehicle NBC Reconnaissance System (LAVNBCRS)
- Joint Transportable Collective Protection System (JTCOPS)
- M48 Apache Aviator Mask
- Joint Service General Protection Mask (JSGPM)
- Joint Service Chemical Environment Survivability Mask (JSCESM)
- Joint Service Aircrew Mask (JSAM)
- Joint Protective Aircrew Ensemble (JPACE)
- Modular Decontamination System (MDS)

#### 4.3.3 Approach

The approach used to determine maintenance and sustainment costs of the NBC defense programs in development is standard across all programs identified. An initial source of information is from the program managers and is based on a request from the JSMG Executive Office that Commodity Area Managers present a maintenance and sustainment cost drivers analysis for each item at the commodity area reviews. This request is intended to help visualize additional costs inherent in system sustainment proactively, such that funds can be realistically programmed.

Subsequent data collection included interviews with the program manager or ILS manager for each item. The results from the interviews concluded that several of the developmental systems identified in the LSP are too premature in their design to conduct an accurate maintenance sustainment cost estimate.

As stated above, some programs have developed EMD units. However, EMD units are typically designed for “proof-of-concept” and may not reflect the actual production hardware in terms of technology or maintenance requirements. The actual NBC detection systems to be fielded in the future will be designed by commercial contractors based on current and innovative technologies. Additionally, maintenance concepts and philosophies have not yet been identified and spares analyses, which provide accurate sparing levels and better cost estimating data, are still years away from completion. Many of the items do not have a firm baseline, in terms of piece parts and have yet to conduct a CDR.

In the absence of maintenance and sustainment cost drivers provided by the project managers, because of the immature nature of the developmental NBC detection system, another approach is to use a general cost estimating relationship (CER) of 10% of the acquisition cost to estimate the funding requirements for depot maintenance and contractor logistics support. This CER is based on information from the U.S. Air Force Materials Support Division for new items introduced into a depot maintenance system. The percentage represents costs that will be incurred from hardware spares, training, labor, and commercial contractor costs. The approach generates a rough-order-of-magnitude (ROM  $\pm 35\%$ ) cost estimate for the funding requirements through FY07.

A more accurate approach is to develop an independent logistics support cost estimate using a parametric estimating tool such as the System Evaluation and Estimation of Resources – Hardware Estimation, Planning, Project Control and Life-Cycle Cost Analysis (SEER-H<sup>TM</sup>). This method was demonstrated in the FY00 LSP for the JBPDS, although the Services have since then revised their estimates, which are presented in this report. Model data included existing contractor data, estimated failure rates, spares analysis, operational estimates, and costs.

This plan will include more detailed cost estimates in the future as developmental programs mature; as more maintenance and sustainment cost drivers are provided by program managers; and as the use of independent logistics cost estimating tools becomes more widespread. Identification of depot maintenance, CLS, and consumables funding requirements and shortfalls early in the design phase will assist the program managers in ensuring that the equipment has a cost effective maintenance program once it is fielded.

## Biological Integrated Detection System (BIDS) JBPDS Platform (see Chart C-14)

Type Classification (MSIII): 8/00

Maintenance Concept: Contractor Logistics Support (CLS)

1<sup>st</sup> Fielding: 12/01

Current Published LSP: 9/97

Special Support Requirements: none

BIDS JBPDS Platform	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$ Approx. \$600K (excluding JBPDS)								
Production Units (per yr)	41 (prior years)								41
Running Total Production Units	41 (prior years)								41
Running Total Production Costs	\$28,404 K (prior yr)								\$28,404K
Below Depot Repair Parts.			\$891K	\$908K	\$927K	\$946K	\$965K	\$984K	\$5,621K
Depot Maintenance Rqmts.		--	--	--	--	--	--	--	--
Contractor Log Support Rqmts. (per year)			\$1,223K	\$1,246K	\$1,272K	\$1,299K	\$1,325K	\$1,352K	\$7,717K
Consumable Rqmts. (per year)			\$3,962K	\$4,035K	\$4,120K	\$4,207K	\$4,291K	\$4,377K	\$24,992K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>			<b>\$6,076K</b>	<b>\$6,189K</b>	<b>\$6,319K</b>	<b>\$6,452K</b>	<b>\$6,581K</b>	<b>\$6,713K</b>	<b>\$38,330K</b>
Note: The above costs are estimates based on the P3I BIDS									
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$164K</b>								

### General

As discussed in section 4.2.2, the BIDS JBPDS Platform is a follow-on program to the NDI and P3I BIDS and NDI LR-BSDS. The BIDS JBPDS Platform system will have a M1113 HMMWV with S-788 Shelter as its platform with a Joint Biological Point Detection System (JBPDS) integrated as the biodetection suite. The LR-BSDS has been cancelled and the user requirements are being re-evaluated.

### Program Status

A US Army 3<sup>rd</sup> BIDS Company will be activated in FY01. A total of 41 BIDS JBPDS Platform systems will be fielded to that company by FY02.

### Sustainment Cost Drivers

Contractor Logistics Support concept for the NDI and P3I BIDS outlined in section 4.2.2 is expected to continue for the BIDS JBPDS Platform.

## Joint Chemical Agent Detector (JCAD) (see chart C-33)

Type Classification (MSIII): 2QFY02

Maintenance Concept: TBD

1<sup>st</sup> Fielding: FY03

Current Published LSP: TBD

Special Support Requirements: TBD

JCAD	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	Approx. \$2,000								
Production Units (per yr)				9827	9117	9122	9130	9130	46326
Running Total Production Units				9827	18994	28066	37196	46326	46326
Running Total Production Costs				\$19,654 K	\$37,988 K	\$56,132 K	\$74,392 K	\$92,652 K	\$92,652K
Below Depot Repair Parts.		--	--	--	--	--			--
Depot Maintenance Rqmts. (1,2)	\$200	--	--	\$1,965K	\$3,799K	\$5,613K	\$7,439K	\$9,265K	\$28,081K
Contractor Log Support Rqmts.		--	--	--	--	--			--
Consumable Rqmts.		--	--	--	--	--			--
<b>Total Sustainment Cost Drivers (sum of above 4)</b>				<b>\$1,965K</b>	<b>\$3,799K</b>	<b>\$5,613K</b>	<b>\$7,439K</b>	<b>\$9,265K</b>	<b>\$28,081K</b>
Note 1: The hardware is still in a preliminary design so depot maintenance requirements have been estimated at 10% of the estimated unit cost.									
Note 2: Below Depot and Depot Level repair requirements are rolled up in this figure									
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$200</b>								

### General

JCAD is a detection system capable of automatically detecting, identifying, and quantifying chemical agents for the following applications: individual warfighter, aircraft, ground vehicles, shipboard, portable monitoring, and standalone configurations. The device must be sufficiently sensitive to warn aircrews before accumulation of a dose, over the entire mission, which will cause miosis or more severe effects, be resistant to the severe interferent environment on a naval vessel, and be small and rugged for individual use. USAF is the lead development service for JCAD through the Human Systems Program Office, Crew Systems Division, Contamination Avoidance Integrated Product Team (HSC/YACN) at Brooks AFB. The JCAD will replace the ICAM and ACADA.

### Program Status

The current JCAD program strategy utilizes acquisition reform initiatives to the fullest extent possible. The JCAD program consolidated six separate service chemical detection programs into one joint program in 1996. An Engineering Manufacturing Development (EMD) contract was awarded to Tracor Aerospace (now BAE Systems North America) on 24 Feb 98. The EMD contract is structured to produce 168 test units for assessment of capability and readiness of the program prior to entering into production. JCAD is expected to be fielded by FY03, with a Milestone III decision expected during 3QFY01.

### Sustainment Cost Drivers

The logistics support concept for the JCAD has not been defined. An underlying philosophy is to design the JCAD system to be maintained at the field or intermediate level, with little if any depot maintenance. This item has no predecessor and no military equivalent, and is expected to use a technology not currently employed in detection systems (surface acoustic wave (SAW)) technology. For these reasons, there was insufficient data to develop a maintenance cost estimate except through projected program costs.

## Joint Biological Point Detection System (JBPDS) Block I (see chart C-16)

Type Classification (MSIII): 6/03

Maintenance Concept: Contractor Logistics Support (CLS) for 18 months, then Depot

1<sup>st</sup> Fielding: 7/03

Current Published LSP: 6/99 (Draft)

Special Support Requirements: Refrigeration required for Identification Assays

JBPDS Block I	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$301K								
Production Units (per yr)		5	16	178	192	192	192	192	971
Running Total Production Units		9	25	203	395	587	779	971	971
Running Total Production Costs		\$25.6M	\$72.2M	\$167.8M	\$260.9M	\$351.5M	\$446.6M	\$529.7M	\$529.7M
Below Depot Repair Parts.		\$0.08M	\$0.21M	\$1.73M	\$3.36M	\$5.00M	\$6.63M	\$8.60M	\$25.61M
Depot Maintenance Rqmts.					\$1.62M	\$2.40M	\$3.19M	\$4.14M	\$11.35M
Contractor Log Support Rqmts.			\$1.10M	\$1.90M					\$3.0M
Consumable Rqmts.		\$0.58M	\$0.63M	\$11.39M	\$12.29M	\$12.29M	\$12.29M	\$12.29M	\$61.76M
<b>Total Sustainment Cost Drivers (sum of above 4)</b>		<b>\$0.66M</b>	<b>\$1.94M</b>	<b>\$15.02M</b>	<b>\$17.27M</b>	<b>\$19.69M</b>	<b>\$22.11M</b>	<b>\$25.03M</b>	<b>\$101.72M</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$25.8K</b>								

### General

The Joint Biological Point Detection System (JBPDS) is intended to rapidly determine the presence or absence of airborne Biological Warfare (BW) agents and type of agents where the system is deployed. The JBPDS detects point source releases as well as sea and ground level releases of line aerial sources; provides local and remote warning capability; and formats threat information for distribution over standard military communication systems. The JBPDS collects, contains and provides suspect samples for laboratory confirmation. The system is housed in a ruggedly designed enclosure for day or night operation in a battlefield environment. The Block I platform specific installation kits enable the JBPDS to be used in a wide variety of battlefield applications: S788 Shelters, stands or poles for perimeter monitoring systems, deck mounted shipboard installations, NBC Reconnaissance vehicles (HMMWV/S788, Light Armored Vehicles (LAV)), and a man portable configuration system.

### Program Status

Support for the JBPDS will be accomplished by maximizing the use of existing logistic systems with standard testing and diagnostic equipment. Within the past year, a hardware change (BAWS III) was made that is expected to reduce the cost of consumables. Low Rate Initial Production will begin in 2QFY02. Milestone III is expected to occur during the 3QFY03. Initial fielding is to begin in the fourth quarter of FY03.

### Sustainment Cost Drivers

The logistics support concept for the JBPDS is still being refined. An underlying philosophy is to perform depot maintenance at the LRU component level of the JPBDS, with some modules being sent to the contractor for repairs. The system is expected to have one depot level support facility for all services. Intermediate and organizational level support will be based on each Service's management support concept.



## Joint Biological Point Detection System (JBPDS) Block II (see chart C-16)

Type Classification (MSIII): 3QFY07

Maintenance Concept: Contractor Logistics Support (CLS) for 18 months, then Depot

1<sup>st</sup> Fielding: 4QFY08

Current Published LSP: 6/99 (Draft)

Special Support Requirements: TBD

JBPDS Block II	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$360K								
Production Units (per yr)								120	120
Running Total Production Units								120	120
Running Total Production Costs								\$63.55M	\$63.55M
Below Depot Repair Parts.								\$1.02M	\$1.02M
Depot Maintenance Rqmts.								\$0.49M	\$0.49M
Contractor Log Support Rqmts. (per year)								(begins FY08)	
Consumable Rqmts. (per year)								TBD	TBD
<b>Total Sustainment Cost Drivers (sum of above 4)</b>								<b>\$1.51M</b>	<b>\$1.51M</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>TBD</b>								

### General

The Joint Biological Point Detection System (JBPDS) is intended to rapidly determine the presence or absence of airborne Biological Warfare (BW) agents and type of agents where the system is deployed. The JBPDS detects point source releases as well as sea and ground level releases of line aerial sources; provides local and remote warning capability; and formats threat information for distribution over standard military communication systems. The JBPDS collects, contains and provides suspect samples for laboratory confirmation. The system is housed in a ruggedly designed enclosure for day or night operation in a battlefield environment. The Block II upgrade will fully meet objectives requirements by insertion of maturing technology and enhanced capability components.

### Program Status

Low Rate Initial Production is scheduled to begin in 2QFY06. Milestone III is expected to occur during the 3QFY07 with initial fielding occurring during the fourth quarter of FY08.

### Sustainment Cost Drivers

The logistics support concept for the JBPDS is still being refined. An underlying philosophy is to perform depot maintenance at the LRU component level of the JPBDS, with some modules being sent to the contractor for repairs. The system is expected to have one depot level support facility for all services. Intermediate and organizational level support will be based on each Service's management support concept.

## Joint Warning and Reporting Network (JWARN) (see chart C-34)

Type Classification (MSIII): 1QFY98

Maintenance Concept: TBD

1<sup>st</sup> Fielding: 3QFY98

Current Published LSP: FY98

Special Support Requirements: none

JWARN	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$1,700								
Production Units (per yr)					7,174	7,210	9,409	18,819	42,612
Running Total Production Units					7,174	14,384	23,793	42,612	42,612
Running Total Production Costs					\$12,197 K	\$24,454 K	\$40,450 K	\$72,443 K	\$72,443K
Below Depot Repair Parts.					--	--	--	--	--
Depot Maintenance Rqmts.					\$3,090K	\$4,367K	\$4,466K	\$4,566K	\$16,489K
Contractor Log Support Rqmts.					--	--	--	--	--
Consumable Rqmts.					--	--	--	--	--
<b>Total Sustainment Cost Drivers (sum of above 4)</b>					<b>\$3,090K</b>	<b>\$4,367K</b>	<b>\$4,466K</b>	<b>\$4,566K</b>	<b>\$16,489K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$0.11K</b>								

### General

The Joint Warning and Reporting Network (JWARN) will provide the joint forces with a comprehensive analysis and response capability to minimize the effects of hostile NBC attacks or accidents/incidents. The JWARN system is an automated NBC Information System comprised of a software application, detector hardware interface, and interfaces to service/joint command, control, communication, computers, information and intelligence (C4I2) systems and various federal databases. It will integrate battlefield NBC detectors into existing service C4I2 system networks. The mission is to provide a near real-time operational capability for Joint Forces to report, analyze and disseminate NBC agent detection, identification, location and warning information. In addition, JWARN will automate tasks required for battlespace management to enhance warfighter abilities to train for and react to NBC events.

### Program Status

JWARN is a software program with hardware interfaces that does not require depot maintenance and is executed through computer systems currently or projected to be used by the military. The solicitation was released in October 1998, and amended in November 1998. The Army intends to use the MICAD (Multiple Integrated Chemical Agent Detection) system as the hardware used in the NBC Reconnaissance System, which will directly interface with JWARN. Some platforms other than the NBCRS will use MICAD but will eventually integrate JWARN into their command and control equipment, replacing MICAD.

### Sustainment Cost Drivers

Since JWARN is a software program with hardware interfaces, neither depot maintenance nor CLS is required. Any software and hardware upgrades or enhancements will occur at the field level as organic maintenance. Although a maintenance concept is not yet defined, a Depot Maintenance Requirement which reflects the organic maintenance was provided by the Project Manager.

## Multiple Integrated Chemical Agent Detection (MICAD) (No chart available)

Type Classification (MSIII): 7/00

Maintenance Concept: Contractor Logistics Support

1<sup>st</sup> Fielding: 11/00

Current Published LSP: 4/98

Special Support Requirements: none

System	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$53K								
Production Units (per yr)	Prior: 89	62							151
Running Total Production Units		151							151
Running Total Production Costs		\$8,003K							\$8,003K
Below Depot Repair Parts.		TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Depot Maintenance Rqmts.		--	--	--	--	--			--
Contractor Log Support Rqmts. (per year)		\$384K	\$106K	\$114K	\$128K	TBD	TBD	TBD	\$732K
Consumable Rqmts. (per year)		\$98K	\$98K	\$98K	\$98K	\$98K	\$98K	\$98K	\$686K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>		<b>\$482K</b>	<b>\$204K</b>	<b>\$212K</b>	<b>\$226K</b>	<b>\$98K</b>	<b>\$98K</b>	<b>\$98K</b>	<b>\$1,418K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>0.65K</b>								

### General

The Multiple Integrated Chemical Agent Detection system (MICAD) is used to integrate sensor inputs from various detectors and interface with reporting software and hardware such as JWARN. MICAD automates NBC report preparation and transmission. The Army intends to install MICAD in all M93 series NBCRS. It will also be compatible with other vehicles, vans, and shelters such as the M1068 Command Post Vehicle, HMMWV, and C2V Command and Control Vehicle.

### Program Status

A production contract was awarded in FY99 and MICAD underwent First Article Test (FAT) in FY00. A total of 89 systems will be installed in M93A1 and subsequent NBCRS vehicles. Of those systems, 27 will be upgraded to a new configuration.

### Sustainment Cost Drivers

There is no depot level maintenance envisioned for MICAD. However, the soldier in the field can switch failed line-replaceable units (LRUs), which are then sent back to the contractor for repair. In this way, the contractor provides maintenance. Contractor Logistics Support will be provided by Intellitec, which is the sub-contractor to Lockheed-Martin that manufactures the individual parts to MICAD. They currently have a three-year contract that is likely to be extended since MICAD will be completely replaced by JWARN in 3-4 years. The major consumables are BA5567 and BA5590 lithium batteries.

## Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD) (see chart C-37)

Type Classification (MSIII): 6/02

Maintenance Concept: Depot Maintenance (CLS-TBD)

1<sup>st</sup> Fielding: 10/03

Current Published LSP: 9/98

Special Support Requirements: none

JSLSCAD	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$108,000								
Production Units (per yr)			75	103	149	198	330	372	1,227
Running Total Production Units			75	178	327	525	855	1,227	1,227
Running Total Production Costs			\$10.3M	\$24.8M	\$43.9M	\$67.3M	\$107.3M	\$152.3M	\$152.3M
Below Depot Repair Parts.				\$300K	\$660K	\$910K	\$2,500K	\$8,400K	\$12,770K
Depot Maintenance Rqmts.				\$3,400K	\$350K	\$450K	\$1,200K	\$2,500K	\$7,900
Contractor Log Support Rqmts.				TBD	TBD	TBD	TBD	TBD	TBD
Consumable Rqmts.				\$100K	\$300K	\$600K	\$1,200K	\$1,600K	\$3,800K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>				<b>\$3,800K</b>	<b>\$1,310K</b>	<b>\$1,960K</b>	<b>\$4,900K</b>	<b>\$12500K</b>	<b>\$24,470K</b>
<b>Total Sustainment Cost Per Unit in FY07 *</b>	<b>\$10.2K</b>								

\*CLS requirements TBD

### General

The JSLSCAD is a passive infrared (IR) detection system that detects the presence or absence of chemical warfare agents in the 800 to 1200 wave number region of the electromagnetic spectrum by monitoring the ambient background IR radiation. The JSLSCAD signal processing hardware discriminates between the chemical targets and the other nontoxic species in a complex battlefield environment.

### Program Status

The JSLSCAD is in the Engineering Manufacturing Development (EMD) phase. Program milestones were (1) PDR in October 1998, (2) CDR in November 1999. Type Classification (Milestone III) is expected in June 2002, with production to begin in August 2002 and fielding in October 2003. The conduct of Development Tests and later Operational Testing may be impacted by the availability of vehicle platforms.

### Sustainment Cost Drivers

The JSLSCAD program is not mature enough to determine the depot maintenance or contractor logistics support concept with certainty. Thus far, depot maintenance requirements have been identified, but it is not yet decided if contractor logistics support will be implemented. Steps recently taken to reduce overall life cycle cost include a design change to brushless motors, which will reduce preventative maintenance.

## Joint Service Lightweight NBC Reconnaissance System (JSLNBCRS) (see charts C-41/C-42)

Type Classification (MSIII): 1QFY04

Maintenance Concept: Depot Maintenance and CLS

1<sup>st</sup> Fielding: 4QFY04

Current Published LSP: 1QFY01

Special Support Requirements: none

JSLNBCRS HMMWV/LAV	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$1,402,700 (True Average Cost per Vehicle) (\$942,800 – HMMWV, \$1,862,600 – LAV)								
Production Units (per yr) HMMWV/LAV		0	28/6	36/6	40/6	40/6	38/7	44/0	226/31
Running Total Production Units		0	28/6	64/12	104/18	144/24	182/31	226/31	226/31
Running Total Production Costs		0	\$26M/ 11M	\$60M/ 22M	\$98M/ 34M	\$136M/ 45M	\$172M/ 58M	\$213M/ 58M	\$213M/ 58M
Below Depot Repair Parts.			\$1,988K	\$3,115K	\$4,160K	\$5,328K	\$6,496K	\$7,664K	\$29673K
Depot Maintenance Rqmts.				\$493K	\$1082K	\$1497K	\$1855K	\$2266K	\$7193K
Contractor Log Support Rqmts. (per year)				\$288K	\$576K	\$576K	\$496K	\$496K	\$2432K
Consumable Rqmts.				\$17,451 K	\$33,633 K	\$51,720 K	\$69,807 K	\$87,894 K	\$260505 K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>			<b>\$1988K</b>	<b>\$21347 K</b>	<b>\$39451 K</b>	<b>\$59121 K</b>	<b>\$78654 K</b>	<b>\$98320 K</b>	<b>\$299803 K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$263K</b>								

### General

The JSLNBCRS is a Marine-led program to provide accurate and rapid NBC combat hazards and toxic industrial information on the integrated battlefield. The JSLNBCRS will provide accurate, rapid NBC hazard information by verifying the presence or absence of NBC hazards, in addition to mapping and marking contaminated areas. The JSLNBCRS will consist of a base vehicle equipped with hand-held, portable, and mounted, current, and advanced NBC detection and identification equipment. (The JSLNBCRS has two variants, the HMMWV M1113 and the LAV base platform; the NBC equipment is the same). The proposed equipment to be housed in these two platforms consists of CAM/ICAM, JWARN, JSLSCAD, JBPDS, AN/VDR-2/ADM-300, and CBMS.

### Program Status

Milestone III for the JSLNBCRS is expected in the first quarter FY04. Low Rate Initial Production of the HMMWV-mounted JSLNBCRS will begin in 2QFY02 while the LAV variant will be built starting in 3QFY01. The prime hardware contractor is TRW.

### Sustainment Cost Drivers

The maintenance requirements for the JSLNBCRS are still being developed. However, on the operator level, circuit cards and other replaceable units are replaced. Depot maintenance is an estimate for the system as a whole, but will include maintenance on the HMMWV and LAV platform. The contractor logistics support will cover mainly the detection components, but as three of them are still developmental (JSLSCAD, JBPDS, CBMS), this is still an estimate. Typical consumables include those for the platform (oil, engine components, tires) and for other components (such as the surface sampler, collective protection).

## Joint Transportable Collective Protection System (JTCOPS) (No chart available)

Type Classification (MSIII): 3/05

Maintenance Concept: TBD

1<sup>st</sup> Fielding: 6/06

Current Published LSP: Pending

Special Support Requirements: none

JTCOPS	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$75K								
Production Units (per yr)						27	27	27	81
Running Total Production Units						27	54	81	81
Running Total Production Costs						\$2030K	\$4030K	\$6030K	\$12090K
Below Depot Repair Parts.						\$75K	\$150K	\$225K	\$450K
Depot Maintenance Rqmts.						--	--	--	--
Contractor Log Support Rqmts. (per year)						\$300K	\$300K	\$300K	\$900K
Consumable Rqmts.						\$25K	\$75K	\$100K	\$200K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>						<b>\$400K</b>	<b>\$525K</b>	<b>\$625K</b>	<b>\$1,550K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$7.7K</b>								

### General

JTCOPS will be a modular shelter system that will provide the ability to process contaminated personnel through a contamination control area into a toxic free area. It will be expandable to meet changing mission needs and will allow collectively protected vans and vehicles to be connected for safe ingress/egress. It can be used as a stand-alone structure or within existing structures. The system will include air filtration, environmental control, and power generation elements, and will be capable of using other available generator/power systems.

### Program Status

A production contract for the JTCOPS has recently been competed. It is expected to reach Milestone III in 2QFY05 and be fielded by 3QFY06. The procurement in FY05-07 is the Block I system. A Block II upgrade is also planned.

### Sustainment Cost Drivers

The maintenance concept has not yet been established, although estimates have been provided for contractor logistics support.

## M48 Apache Aviator Mask (see Chart D-36)

Type Classification (MSIII): 6/96

Maintenance Concept: Depot Level Maintenance

1<sup>st</sup> Fielding: 5/02

Current Published LSP: 9/97

Special Support Requirements: none

M48 Mask	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$2,500								
Production Units (per yr)			1,500	2,377					3,877
Running Total Production Units			1,500	3,877					3,877
Running Total Production Costs			\$790K	\$2,043K					\$2,043K
Below Depot Repair Parts.			--	--	--	--	--	--	--
Depot Maintenance Rqmts.			0	0	0	0	0	0	(FY09-10: \$0.4K)
Contractor Log Support Rqmts.			--	--	--	--	--	--	--
Consumable Rqmts. (per year)			0	\$310K	\$650K	\$690K	\$710K	\$730K	\$3,090K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>			<b>\$0K</b>	<b>\$310K</b>	<b>\$650K</b>	<b>\$690K</b>	<b>\$710K</b>	<b>\$730K</b>	<b>\$3,090K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$188</b>								

### General

The M48 is a product improvement of the M43 Type I Mask which is currently used by the AH-64 Apache helicopter crew. The M48 will provide face, eye, and respiratory NBC protection. The M48 includes a lightweight motor blower that can be mounted on the user. The blower provides filtered, breathable air that keeps the head cool and prevents fogging of the eyelens.

### Program Status

The M48 requires redesign to pass air worthiness qualification. At present, funds to complete changes are unavailable. Fielding should begin within two years after funding is provided.

### Sustainment Cost Drivers

Depot maintenance requirements were identified for FY09-10, at the time when individual components may be identified for replacement through surveillance efforts. Consumable requirements include batteries to run the blower motor.

## Joint Service General Protection Mask (JSGPM) (No chart available)

Type Classification (MSIII): 9/04

Maintenance Concept: TBD

1<sup>st</sup> Fielding: 8/06

Current Published LSP: 3/01

Special Support Requirements: none

JSGPM	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$94								
Production Units (per yr)						120,000	170,000	170,000	460,000
Running Total Production Units						120,000	290,000	460,000	460,000
Running Total Production Costs						\$15,680 K	\$34,540 K	\$53,490 K	\$53,490K
Below Depot Repair Parts.						TBD	TBD	TBD	TBD
Depot Maintenance Rqmts.						--	--	--	--
Contractor Log Support Rqmts.						TBD	TBD	TBD	TBD
Consumable Rqmts.						TBD	TBD	TBD	TBD
<b>Total Sustainment Cost Drivers (sum of above 4)</b>						<b>TBD</b>	<b>TBD</b>	<b>TBD</b>	<b>TBD</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>TBD</b>								

### General

The Joint Service General Protection Mask (JSGPM) will provide face, eye, and respiratory protection from battlefield concentrations of CB agents, toxins, toxic industrial materials (TIMs) and radioactive particulate matter. The mask will offer improved protection, field of view, equipment compatibility, lower breathing resistance, and reduced weight/bulk.

### Program Status

JSGPM is expected to reach Milestone III in 4QFY04 with a production contract awarded in 2QFY05.

### Sustainment Cost Drivers

This system is still in a preliminary stage, thus the maintenance concept is not yet defined.



## Joint Service Chemical Environment Survivability Mask (JSCESM) (No chart available)

Type Classification (MSIII): 9/04

Maintenance Concept: CLS - TBD

1<sup>st</sup> Fielding: 8/06

Current Published LSP: TBD

Special Support Requirements: none

JSCESM	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$75								
Production Units (per yr)						100	200	200	500
Running Total Production Units						100	300	500	500
Running Total Production Costs						\$12,500 K	\$37,500 K	\$62,500 K	\$62,500K
Below Depot Repair Parts.						TBD	TBD	TBD	TBD
Depot Maintenance Rqmts.						--	--	--	--
Contractor Log Support Rqmts.						TBD	TBD	TBD	TBD
Consumable Rqmts.						TBD	TBD	TBD	TBD
<b>Total Sustainment Cost Drivers (sum of above 4)</b>						<b>TBD</b>	<b>TBD</b>	<b>TBD</b>	<b>TBD</b>
<b>Total Sustainment Cost Per Unit in FY07</b>									

### General

The Joint Service Chemical Environment Survivability Mask (JSCESM) is a one-time use, limited protection, disposable respiratory protective mask for Special Forces and special purpose uses. It is a modified NDI item and fits in the BDU pocket of the warfighter.

### Program Status

The Joint Operational Requirements Document (JORD) is still in draft. The JSCESM is expected to achieve Milestone III in 4QFY04 followed by procurement in FY05.

### Sustainment Cost Drivers

This system is still in a preliminary stage, thus the maintenance concept is not yet defined.

## Joint Service Aircrew Mask (see Chart D-48)

Type Classification (MSIII): 10/05

Maintenance Concept: CLS - TBD

1<sup>st</sup> Fielding: 6/06

Current Published LSP: 12/2000 (Draft)

Special Support Requirements: none

JSAM	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$1600 (Non-BPG); \$3400 (BPG)								
Production Units (per yr)							3,800	15,000	18,800
Running Total Production Units							3,800	18,800	18,800
Running Total Production Costs							\$23,700 K	\$74,600 K	\$98,300K
Below Depot Repair Parts.								\$0.1M	0.1M
Depot Maintenance Rqmts.								--	--
Contractor Log Support Rqmts.								--	--
Consumable Rqmts. (per year)								\$0.5M	\$0.5M
<b>Total Sustainment Cost Drivers (sum of above 4)</b>								<b>\$0.6M</b>	<b>\$0.6M</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$32</b>								

### General

The Joint Service Aircrew Mask (JSAM) will provide all aircrews with a standard mask for individual head-eye-respiratory protection against CB agents, and radiological particles. For high performance aircraft, the mask will be compatible with G-protection systems.

### Program Status

Delivery of prototype systems is scheduled for January 2002. Milestone III will be achieved in 1QFY05 with production contract award in 4QFY05 and fielding beginning in 3QFY06.

### Sustainment Cost Drivers

This system is still in a preliminary stage, thus the maintenance concept is not yet defined.

## Joint Protective Aircrew Ensemble (JPACE) (see Chart D-49)

Type Classification (MSIII): 3/05

Maintenance Concept: none

1<sup>st</sup> Fielding: 9/05

Current Published LSP: 6/00

Special Support Requirements: none

JPACE	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$371								
Production Units (per yr)					17,400	57,600	58,500	38,400	171,900
Running Total Production Units					17,400	75,000	133,500	171,900	171,900
Running Total Production Costs					\$6,960K	\$28,000K	\$49,900K	\$64,400K	\$64,400K
Below Depot Repair Parts.									
Depot Maintenance Rqmts.									
Contractor Log Support Rqmts.									
Consumable Rqmts.									
<b>Total Sustainment Cost Drivers (sum of above 4)</b>									
<b>Total Sustainment Cost Per Unit in FY07 *</b>	<b>\$0</b>	<b>* does not include laundering or surveillance testing</b>							

### General

The Joint Protective Aircrew Ensemble (JPACE) will develop a protective ensemble to provide percutaneous protection for all aircrews. Its CB protection will be equivalent to that of JSLIST for at least 16 hours. It should provide protection for all Service aircrews in both fixed wing and rotary wing aircraft.

### Program Status

JPACE is expected to reach Milestone III in 2QFY05 with initial fielding in 4QFY05. Milestone III had been slipped in order to accommodate operational test with JSAM.

### Sustainment Cost Drivers

None were identified.

## Modular Decontamination System (MDS) (see Chart F-6)

Type Classification (MSIII): 12/98

Maintenance Concept: (no Depot Maint or CLS required)

1<sup>st</sup> Fielding: 3/02

Current Published LSP: 7/98

Special Support Requirements: none

Modular Decon System	Unit Cost	FY01	FY02	FY03	FY04	FY05	FY06	FY07	Total
Unit Cost	\$66,000								
Production Units (per yr)	Prior: 135	0	45	42	41	37	49		349
Running Total Production Units		135	180	222	263	300	349		349
Running Total Production Costs		\$9000K	\$12,200K	\$15,200K	\$18,100K	\$20,900K	\$24,600K		\$24,600K
Below Depot Repair Parts.			\$4.4K	\$8.5K	\$12.9K	\$15.4K	\$18.8K	\$22.3K	\$82.3K
Depot Maintenance Rqmts.			--	--	--	--	--	--	--
Contractor Log Support Rqmts.			--	--	--	--	--	--	--
Consumable Rqmts.			\$45.6K	\$87.9K	\$132.8K	\$159.2K	\$194.9K	\$230.6K	\$851K
<b>Total Sustainment Cost Drivers (sum of above 4)</b>			<b>\$50K</b>	<b>\$96.4K</b>	<b>\$145.7K</b>	<b>\$174.6K</b>	<b>\$213.7K</b>	<b>\$252.9K</b>	<b>\$933.3K</b>
<b>Total Sustainment Cost Per Unit in FY07</b>	<b>\$0.72K</b>								

### General

The Modular Decontamination System (MDS) provides a standalone Decontaminant Pumper Module (M21) to mechanically dispense and power-brush DS2 and field expedient decontaminants. The MDS also provides a standalone High Pressure Washer (M22) which provides high pressure/ hot water for gross removal of contamination, rinsing decontaminants, personnel showering, and includes hydrant adapters for urban theater water sources. The MDS thus provides thorough decontamination capability.

### Program Status

The MDS achieved Milestone III in December 1998. The First Unit Equipped is expected in 2QFY02.

### Sustainment Cost Drivers

No maintenance at the depot level or contractor logistics support was identified. The MDS relies on fuel for operation and requires an electric start that can be provided by battery. Consumables include filters and engine oil. Additionally, DS2, water, or a field expedient decontaminant is required (but is not included in the consumable requirements).

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## **5.0 Industrial Base Management Plan**

### **5.1 Purpose**

The ongoing evolution of the joint NBC management structure is impacting the logistics mission area in several ways. There is the continued re-examination of storage, maintenance and the overall management of NBC defense equipment. Additionally, while consolidation of RDA is proceeding, related logistics issues such as wartime requirements and related funding that are Service-controlled impact the joint effort, and affect the overall health of the industrial base for NBC equipment. This section summarizes additional studies that have examined the current state of these issues including industrial capability to make up known inventory shortfalls within 120 days.

### **5.2 Joint Service Integrated Product Team**

Included in the mission of the Joint Service Integrated Product Team (IPT) for the Logistic Support Plan is an assessment of the Industrial Base. This assessment is designed to assist the Services in identifying problems and issues related to production capabilities of consumable and end item Chemical and Biological Defense Equipment (CBDE). It identifies CBDE not able to fully support 2 MTW requirements due to asset shortfalls, and documents maximum production capabilities, warm and cold base, for each item. These assessments provide DoD decision-makers with accurate industrial base information and analysis.

#### **5.2.1 FY99-00 Industrial Base Management Plan**

The Joint Service NBC Defense Industrial Base Management Plan (IBMP) purpose is to provide a single management process for all Services. The IBMP will summarize the results of industrial base activities and assessments initiated/completed during a two-year period, either jointly or individually conducted by the IPT member organizations. The plan is an assessment of the NBC Defense Industrial Sector and its ability to meet the requirements of two MTWs (reflecting guidance from the Defense Planning Guidance and the Quadrennial Defense Review).

The IPT is addressing issues from across the Services for more than 128 items/systems and spare parts critical to readiness. The IPT is conducting analyses to include industrial and technology capabilities, alternative sources of supply, and a financial and economic analysis. These analyses will provide the NBC management structure with alternatives and recommendations within the sub-sectors of NBC defense.

#### **5.2.2 Industrial Base Sustainment Capability**

In support of the LSP, the IPT has applied a standard process developed by its sub working group. The process consists of reviewing a number of generic IB options to eliminate items shortages. Some of the options include group buys, established

alternative sources, adding surge clauses to existing contracts, and paying the contractor to maintain a cold/warm production line (annual cost associated with this option). From the above IB options, the IPT identified pertinent criteria/information for each option to ask Industry, Procurement, and the Item Managers. One of key criteria is production capability of the vendor and how to address shortages when required within the 120 day requirement/guidelines as defined by the DPG.

There are several assumptions underlying this study: 1) the JCHEMRATE IV study includes all requirements for two MTWs; 2) the funding to implement surge productions will be available on the first day of the first MTW; and 3) IPT recommendations are implemented.

#### 5.2.2.1 Current Findings

The U.S. Army Materiel Systems Analysis Activity (AMSAA, formerly IEA) completed the surveys of NBC defense equipment in 1998 and continued with updated studies in 1999 and 2000. Wherever possible, AMSAA recommended industrial preparedness measures (IPMs) that would accelerate production to offset shortfalls. Of the 125 items analyzed, fifty-two items showed potential or existing inventory shortfalls that could not be offset by production capabilities within the two MTW timeframe. Summaries of these surveys can be found at Appendix H. While the overall health of the NBC Defense Sector is improving, there continues to be an inability to surge produce to meet current shortfalls. If this surge capability were desired, it would require investment into several warm base production lines. Specific issues identified in each of the commodity areas follows.

Of the contamination avoidance programs, shortages of end items such as the CAM/ICAM, AN/KAS-1 and M21 RSCAAL could be solved by increased purchases, but could not be made up in a surge production during a 120-day timeframe. Batteries seem to have a stable production base, despite some visibility issues within the Services. As the drive for using common batteries in multiple defense systems continues (for instance, the BA 5590 is used in radios as well as the ACADA), it is difficult to identify whether or not the number of batteries procured is adequate to support current quantities of detection systems. Of the remaining items, M9 paper could require additional industrial planning to prevent wartime shortages. M273/293 maintenance kit quantities are critically low. Immediate procurement orders might develop an industrial capability to surge shortfalls.

Individual protection items show shortages that industry could surge-produce to fill, but only production from a warm base would support a two MTW scenario timeframe (which does not currently exist). Current production of the JSLIST suit will mandate reliance on the aging BDO, Saratoga and Mark III OG stocks until an adequate stockpile of JSLIST suits exists, as there is not a large enough industrial base now to meet the current and projected requirements. The Aircrew Uniform Integrated Battledress (AUIB) and Impregnated CPU are no longer in production. The CWU-66/77 is not in production; however, procurement actions are underway to begin production in FY99.

Shortages of SCALP, CPUs. Helmet Covers and M40 second skins could be made up by increased purchases, but not in adequate quantities if started from a cold base during an MTW contingency. There are textile firms that could assist in wartime contingencies, but as noted, they would be starting from a cold base and would require a substantial start-up period. JSLIST gloves and boots are not in production, but the industrial base supporting B/GVOs and protective gloves is adequate for future production of these items.

The M20A1 SCPE has a large shortfall that could not be made up by industry during a 120-day contingency. Collective protection filters across the board show severe shortages in the near term, but existing production contracts should build up resources to guard against wartime shortages if procurement funds are allocated against these shortages. Continued diligence in this area is required to prevent critical shortfalls, as has occurred in the past. If DoD forces deploy more forces than those numbers quoted in the JCHEMRATES study, this area could demonstrate critical shortfalls that industry could not fill by surge production.

In the decontamination area, production of the M291 decon kit is stable at Pine Bluff Arsenal. There is no domestic production of STB, however, foreign producers and industrial substitutes could make up any shortages. Current stocks of M295 decon kits, however, are critically low to the point that industrial surge could not make up the requirements necessary. By the JCHEMRATES study analysis, the military is critically short DS-2, especially M13 Cans and 5-gallon can configuration. Continued analysis in this area is required.

Medical consumables show a shortfall in diazepam injections and PB tablets that should be addressed. Also, the turnover due to shelf-life expiration calls for continued planning and industry involvement. Medical CB defense planning is closely integrated with non-medical CB defense programs, and will continue to receive close scrutiny.

### 5.3 Summary

This concept will support the joint service NBC defense community by focusing on specific critical issues. The IPT will complete the Industrial Base Sustainment Capability study in late 1999. The IPT will expand the Industrial Base Assessment to cover additional NBC defense items over the next two years. Results will be integrated into the each year's Logistics Support Plan and Annual Report to Congress. Summary assessments can be found at:

Contamination Avoidance programs	pages H-1 through H-15
Individual Protection programs	pages H-16 through H-35
Collective Protection programs	pages H-36 through H-43
Decontamination programs	pages H-44 through H-47



Medical Programs

pages H-48 through H-52

Industrial Base Capabilities

pages H-53 through H-56

## 6.0 Other Studies

The following studies were activities initiated since the initial November 1996 Logistics Support Plan. In particular, the shelf life and surveillance IPTs were initiated as a result of the first LSP.

### 6.1 SBCCOM M40 Mask Study

The Commander of SBCCOM directed a feasibility study of outsourcing selected sustainment functions for the M40/M42 mask. These logistics support functions were considered a Contractor Logistics Support Center (CLSC). The purpose of this study was to determine: 1) if a commercial market exists, does it have the interest and the capability; 2) if there are enough commercial sources available to compete for the outsourced work; and 3) if outsourcing would result in the best value.

#### 6.1.2 Approach

An integrated product team (IPT) was formed to develop the alternatives, compute the estimated costs and develop the best value alternative. The IPT developed a list of all functions, and then used that list to form the three alternatives:

- Alternative 1: Army retains all Logistics Support Functions ("Continue Acquisition Reform").
- Alternative 2: Outsource Selected Logistics Support Functions. These selected functions include: Item and Parts management; stock control and purchase; distribution; inventory control and warehousing; shipment; and parts procurement and manufacture.
- Alternative 3: Outsource all Logistics Support Functions, excluding Inherently Government Functions. This includes all the functions identified in Alternative 2, plus: field support; and Technical and Engineering Support.

While the IPT was computing the Government costs for all three alternatives, a Commerce Business Daily announcement was issued, soliciting interested contractor support for the study, at no cost. The questionnaire was sent to thirteen commercial firms asking them: 1) if they had an interest; 2) if they had the capability; and 3) to estimate the cost for Alternatives 2 & 3. After the data was gathered, a best value analysis was performed using the model:

$$\text{Value} = \text{Cost} \times \text{Performance} \times \text{Risk}.$$

### 6.1.3 Findings

Only two firms completed the questionnaire and only one of the two provided cost estimates. Interviews with other firms indicated many would only respond to a formal Request for Proposal (RFP). Without a firm commitment by the Government, these firms were unwilling to commit the resources to complete the questionnaire. This lack of competition was a major issue for the IPT and resulted in this area receiving a high risk rating.

The IPT found Alternative 1 to be the best value. Alternative 2 and 3 offered increased performance, but cost more and had a higher risk. There may be other issues that could cause the issue to be revisited, such as the continued downsizing of the Government workforce, and the need to support the industrial base.

### 6.1.4 Analysis and Recommendations

The IPT recommended DoD continue with Alternative 1, and acquisition reform. Officials may want to consider establishing a small pilot program in lieu of a full CLSC. This establishment would demonstrate the value of a CLSC, and may lead DoD to consider enlarging the concept to a full CLSC, including all NBC Defense items. Any plan to move toward establishing a CLSC needs to address transferring parts to a private firm, how to fund the private firm, and what contract mechanism to use. The IPT recommended that DoD use Operations and Maintenance funding, and use a flexible long-term contract with both fixed price and cost plus features.

## 6.2 **Joint Service NBC Equipment Surveillance Technical Working Group**

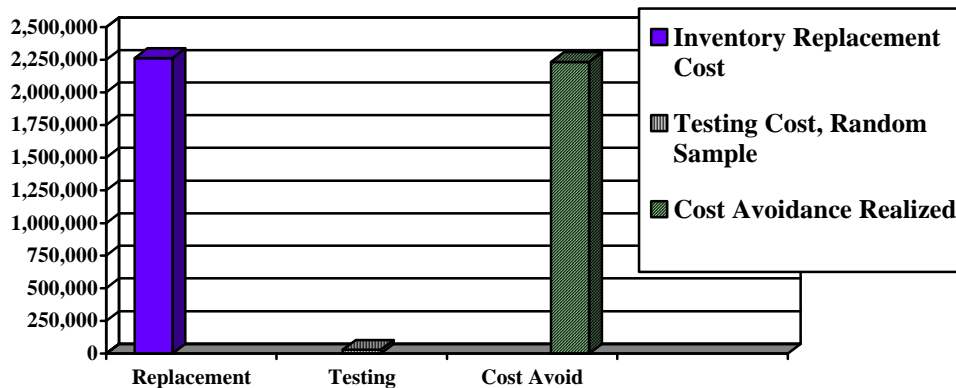
The Joint Service NBC Equipment Surveillance Technical Working Group (TWG) is chaired by the Marine Corps. Meetings have been held at different locations and have recently included the DLA chaired Shelf Life IPT. The JS Surveillance TWG has developed a draft list of all the National Stock Numbers (NSNs) for all the NBC defense equipment. This list has over 1,800 items in total. The objective of the working group is to review all NBC defense equipment to determine if shortfalls exist in the surveillance program, and to present a cost-benefit analysis. For example, the group recently examined the benefits of testing glove inventories to avoid replacement costs (see figure 6.1). Work will continue during this fiscal year.

One product of the Marine Corps Surveillance Program is the NBC Defense Equipment Management Program (DEMP) database, which is envisioned as an interactive tracking tool for inventory, maintenance, and shelf life data for all NBC defense equipment for all services. At present, a prototype database has been demonstrated and is populated with data for USMC NSNs.

The working group is also examining using the DoD M204 program to track NBC items requiring surveillance. The DoD M204 program corrects material weakness, and it helps to solve problems to get storage standards published and up-to-date. It also ensures uniform DoD shelf life materiel management and this system will save funds by allowing managers access to vital information. Defense Support Center Philadelphia has loaded this program with information on the vast majority of the NBC items that they manage. This includes chemical protective suits, gloves, and TAP gear. The working group is recommending that all data for NBC defense items be entered as soon as resources allow. The Marine Corps chair has obtained \$1.7 million to implement a pilot surveillance program using the M204 program, which may lead to a larger joint program for all NBC defense equipment. To successfully execute joint service surveillance of all DoD protective masks, the Marine Corps chair estimates that they will require \$14 million in funding over the next six years.

As an example of the surveillance efforts ongoing, the group reviewed FY98 toxic glove testing that was ongoing at Albany/Barstow depots. The cost of toxic testing through random sampling was \$30,000 to examine the inventory of condition code "D" and "J" protective gloves. By extending the shelf life based on these tests, DoD was able to avoid replacement costs of \$2,234,236.10 (see figure 6.1).

**Figure 6.1 FY98 Toxic Glove Testing, Albany/Barstow**



The Army is pursuing an initiative to consolidate all DS-2 storage at Seneca Falls. If the Marine Corps's requirements for 24-hour contingency access and funding issues can be included, there may be significant cost savings to DoD. The group is also coordinating the removal of all toxic testing of CP Footwear Covers.

### **6.3 Joint Service Equipment Surveillance Program**

In 1984, with the assistance of the U. S. Army Defense Chemical Equipment (DCTE) Division, Pine Bluff Arsenal, the NBC Test and Evaluation Program was established to conduct surveillance testing and evaluation of all Individual Chemical Protective Equipment throughout the Marine Corps. The focus of the program was to ensure the combat readiness of NBC assets held at all levels of supply, from the depots to the using units, while maximizing the service life of assets. A surveillance unit was established at each of the Marine Corps Logistics Bases to perform both mobile and fixed site testing. Testing of overseas assets was accomplished utilizing a mail in program.

During Desert Shield, the two facilities conducted around the clock operations to ensure every Marine deploying to Southwest Asia had a serviceable Field Protective Mask and chemical ensemble. The two Test and Evaluation Units performed tests on over 94,000 masks from field units and warehouse stockpiles during this period.

The program was re-evaluated following Desert Shield/Desert Storm and reorganized to better support the Marine Forces. The Test and Evaluation Units were moved from the Logistics Bases to sites at Camp Lejeune, NC and Camp Pendleton, CA. A new test facility was stood up in Okinawa, Japan to support the high demand for overseas testing. Unmanned sites in Iwakuni, Japan (supported by the Okinawa unit) and Kaneohe Bay, Hawaii (supported by the Camp Pendleton unit) were also established,

In 1997, the Department of Defense encouraged the program to support NBC surveillance within all the branches of service. The program's name was changed to the Joint Service Equipment Surveillance Program and the Test and Evaluation Units were renamed as Equipment Surveillance Units. In 2000, a "NBC Defense Equipment Assessment Unit" was established in Dallas/Ft Worth to support the NBC defense equipment consolidation at the MARFORRES Single Site Storage Facility (SSSF).

The program provides surveillance, directed screening services, contracted toxic testing, repair, vacuum packaging, technical support, guidance and training to all services in support of NBC Individual Protective Equipment. Asset surveillance is utilized to detect degradation trends and promote unit readiness. Certified personnel and equipment are used to visually and mechanically test the assets.

The Equipment Surveillance Units are able to perform intermediate level repairs of NBC assets to include M41 PATS and diagnostic checks on CAMs to correct defective assets. These repairs can range from parts replacement, patching, eye lens crimping to packaging and repackaging. While on site, these teams provide training in the preventive maintenance and care of assets to the command.

The DCTE Division at Pine Bluff Arsenal is the alternate source for NBC Individual Protective Equipment to support special surveillance efforts beyond the current

program's capacity. Future plans are to expand the program to include Navy surveillance personnel support and providing surveillance services in support of general clothing and equipment.

The program has a far-reaching impact upon NBC readiness throughout the services. It provides critical input into the research, development, testing and evaluation of new NBC equipment. The program is also a key for the joint service's efforts to standardize NBC policy and procedures.

#### **6.4 Joint Service NBC Defense Shelf Life Subcommittee**

The Joint Service Shelf Life Subcommittee is discussing the benefits of co-mingling joint service NBC defense assets, utilizing the first in, first out (FIFO) method. The group is evaluating the benefits of consolidating additional chemical defense equipment at Bluegrass Army Depot, Richmond, KY. They are also recommending a policy change to the current DoD Shelf Life Policy, so that at least one year of shelf life is remaining before an item is issued to using units, and at least three and one half years remaining on items sent to the Maritime Prepositioning Ships (MPS).

#### **6.5 DoD/FDA Shelf Life Program**

The DoD/FDA Shelf Life Program was developed by the Department of Defense Health Affairs (DoD HA) and the Military Medical Departments in response to Congressional concern over the conservation of military medical resources. The program's focus is to save replacement cost of date sensitive medical materiel especially medical materiel in War Reserve Stocks, Medical Biological Defense Materiel Programs and Medical Chemical Defense Materiel Programs. The Joint Readiness Clinical Advisory Board (JRCAB) manages the shelf-life extension program for the Services and interfaces with the FDA. The FDA request samples from the JRCAB and the Services. The samples have an initial potency test performed, followed by a 90-day stress test, and then a final potency test. The potency results are compared against a degradation curve, and a new potency period is assigned. The FDA sends the information to the JRCAB and Services who disseminates instructions to extend and remark or destroy the materiel to activities and units worldwide. The same lots are subjected to yearly retest and subsequent extensions until the materiel fails or is removed for lack of sufficient on-hand quantities required for testing. The Army maintains its extended materiel at Meridian Medical Technologies for use by Force Package 3 and 4 units. The Air Force maintains it materiel at its local medical logistics activities that remark the materiel and maintains it for the deploying units. The Navy remarks the materiel and maintains it with the unit. The Marines remark the materiel at its centralized storage locations. It is currently looking at other alternatives, similar to the Army's, to replace pen and ink changes. The DoD/FDA Shelf Life Program has saved an average of \$118.50 of medical chemical defense materiel from having to be destroyed and repurchased, for every \$1.00 it has cost the Services to get materiel tested and extended by the FDA.

## **6.6 Medical CB Casualty Planning Tool**

The Medical community did not have a tool to use in planning CB casualties. The Army Surgeon General has developed an interim operational planning tool that can be used at all levels of medical planning. The tool uses standard databases, i.e., FEDLOG, the AmedP-8 series, the JRCAB time, task, treater files. A planner enters a population, military, civilian, or mix. An agent, biological or chemical is released over the area. Casualties are generated. Charts and databases show the casualties, medical supplies, beds, personnel and evacuation vehicles needed to care for the casualties by day. The tool can be run on any PC or laptop computer. The current version is unclassified but a classified version is being developed to integrate with the Medical Analysis Tool (MAT) which is used in developing medical force structure.

## **6.7 Joint NBC Defense Board Requirements Study**

During FY99/00 the Joint NBC Defense Board has been revalidating the 2 MTW requirements for selected equipment. In plans such as this Logistics Support Plan, the 2 MTW requirements can be drawn from several sources. The JCHEMRATES provides consumption rates for consumables and a limited number of end items that are expected to experience losses due to wear and tear. Services also have the option of providing their own 2 MTW requirement if they disagree with JCHEMRATES calculations.

This study is the first effort to jointly develop quantity requirements for specific end items. It further ensures that the requirements are uniformly presented across all the important joint planning documents (Joint Service Logistics Support Plan, Joint Service Research Development and Acquisition Plan, Joint Service Modernization Plan, Joint Service Annual Report to Congress). The results of this study are incorporated in this Logistics Support Plan.

This effort will also examine each Service's total acquisition requirements, which exceed the 2 MTW requirements by the additional quantities needed for training maintenance, war reserves, prepositioned stocks, and all other non-MTW forces.

## **6.8 JSIG Mask Surveillance Study**

The Joint Service Materiel Group established a Joint Service Mask Technical Working Group to evaluate issues related to the condition of fielded masks. They recommended that the services conduct a two-year retail mask surveillance pilot study. Based on the potential severity of these findings, the Joint Service Integration Group was tasked by the Office of the Secretary of Defense Deputy for Chemical/Biological Defense to examine the findings from the user perspective.

The Joint Service Integration Group's Process Action Team (PAT) reviewed the pilot program and provided their final report in November of 1999. Upon direction of the

Deputy for Chemical/Biological Defense the results of this report are presented here. The following is the Executive Summary:

## **EXECUTIVE SUMMARY**

### **Joint Service Integration Group Mask Surveillance Process Action Team Final Report**

**1. Background.** The Joint Services initiated a two-year pilot program starting in FY97 to assess the condition of fielded protective masks, and to determine the best approach for follow-on Joint Service retail mask surveillance. The two-year retail mask surveillance pilot program was completed and the results were provided in a final report in August 1999. In light of the data provided in this report, the JSIG PAT was tasked to provide a final review that addresses the current status of the problems and recommendations identified in its interim report. The PAT reconvened 13-14 October 1999. This report summarizes the findings of the PAT.

**2. Discussion.** Surveillance was conducted on 19,218 protective masks throughout DoD utilizing visual examinations followed by assessment on special test equipment. Defect severity was classified as minor, major, and critical. In general, most visual defects and many of the machine detected defects could have been recognized and fixed at the individual or unit level by following procedures outlined in the appropriate Technical Manuals/Technical Orders (TM/TO).

**3. Observations/Conclusions.** The PAT identified four broad areas of concern; TMs/TOs, training, leadership, and service unique problems. Generally, TMs/TOs are not being used effectively, training is not adequate, and leader emphasis on NBC defense is lacking. The PAT concluded that the problems and recommendations are for the most part service-specific and service representatives made recommendations accordingly that must be addressed.

#### **4. General Recommendations.**

A. That the Joint NBC Defense Board forward the Joint Service FY97 & FY98 Retail Mask Surveillance Final Report and this report to the Joint Staff. In order to increase awareness throughout the Services, these reports should also be disseminated to the lowest level within each service.

B. That the Joint Services continue mask surveillance to monitor fielded protective masks for degradation trends and potential maintenance improvements. It is also recommended that the Office of the Secretary of Defense establish a separate funding line for mask surveillance.

C. That future protective masks be developed that require lower maintenance and are more “user friendly”. Masks of the future should be designed with a



reduction of sharp edges; e.g. eyelens retaining rings and drink tube connecting blocks. Some operational concepts of a future mask could include a built-in leak detector and/or the color coding of the inside of the mask that depicts critical areas which need to be checked to determine operational efficiency.

## 7.0 Summary

The Joint Service Nuclear, Biological and Chemical Defense Logistics Support Plan for 2001 focuses on DoD readiness and sustainment capabilities, specifically their ability to survive and sustain combat operations in an NBC-contaminated environment. The measures used to determine this are the two Major Theater War scenario requirements as calculated by the Service-approved April 1999 JCHEMRATES IV study. Based on these requirements, the overall status of NBC defense logistics is improving over the next seven years, with the exception of a small number of end items and consumables.

These numbers should not be confused with the total Service requirements. Because of the requirement to equip active and Reserve forces, to train warfighters during peacetime, and to support maintenance sustainment requirements, the Services procure more than the two MTW requirements briefed in the JCHEMRATES IV study. The JCHEMRATES requirements should be seen as the minimum requirements that give the Services a basic capability to survive and sustain combat operations in an NBC-contaminated environment.

In the development of the 2000 report, the Logistics Support Plan Integrated Product Team agreed to redefine the two MTW requirements to include the sum of the initial issue plus the consumption calculated by the JCHEMRATES IV study for consumables. This will insure that our forces have sufficient stocks remaining after the conflict to enter yet another conflict. The IPT also suggested that the JCHEMRATES IV study should be revisited and refined to include requirements for supporting military forces (Army and Air Force transportation support, Navy fleet in theater, Marine Corps forces on ships, etc.).

### **Two MTW Requirement for Consumables**

Previous definition: equal to the greater of JCHEMRATES Initial Issue **or** Consumption  
⇒ No inventory remains after 120 days

New definition: equal to JCHEMRATES Initial Issue **plus** Consumption  
⇒ Some inventory remains after 120 days

***Readiness for the next conflict is enhanced***

This report is best viewed as a snapshot in time of the DoD logistics status as of October 1, 2000, when the Services and Defense Logistics Agency (DLA) submitted the results of their respective data calls. The U.S. Army Center for Army Analysis ran the JCHEMRATES IV scenario, resulting in the Service-approved April 1999 data presented here. The utility of this Logistics Support Plan comes as its value as an indicator over time, identifying trends and future challenges for the joint NBC defense community, especially as new systems enter the inventory and older systems are phased out. This plan is also useful as a catalyst for change.

Our findings are displayed by commodity area, identifying shortages in fielded end items and consumables in particular (addressed in Table 7.1). Specifically, our findings show nineteen fielded CB defense end items are short the required two MTW requirements, and forty-nine CB defense consumable items are short the two MTW requirements. The total funding shortfall across all four Services projected in FY07 amounts to \$1407.0 million, assuming no changes in the procurement patterns identified in the report.

We have attempted to integrate information on new equipment entering the inventory identified in the Joint Service NBC Defense Research, Development and Acquisition (RDA) Plan. We limited the inclusion of RDA end items to those entering production and fielding phases over the next seven years (FY01-07). This resulted in a total of nineteen developmental items (mostly contamination avoidance programs) being included in this study to examine fielding trends. We have not identified these as funding issues as they are being managed by joint funds rather than O&M funds, and, in many cases, their funding continues past FY07. We did point out challenges that will emerge given the desire to phase out older systems as new systems enter. In a few cases, there exists a period where both systems are retained in the field until quantities of the newer system fill all Services' requirements.

Using the Service-approved JCHEMRATES IV study dated April 1999 to determine the average two MTW requirement (which for consumables is redefined to include initial issue plus consumption), the DoD NBC defense program has the following shortfalls (see table 7.1). As mentioned previously, the funding estimate for end items does not include shortages of developmental programs that continue production past FY07. Those developmental items are funded under joint procurement funds identified in the CB Defense POM Strategy and were not duplicated in this report.

**Table 7.1 DoD NBC Defense Shortfalls in Fielded Equipment – FY07 Status  
(Avg MTW Rqmts)**

**End Items (Jointly Funded)**

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	33	7	94.4
Individual Protection	13	8	88.9
Collective Protection	5	1	14.6
Decontamination	6	2	34.9
Medical	1	1	2.9
<b>TOTAL</b>	<b>58</b>	<b>19</b>	<b>\$235.7 M</b>

**Consumables (Service O&M Funded)**

Commodity Areas	No. of Programs Evaluated	No. of Programs Short of 2 MTW Avg. Rqmts	Funding Shortfalls (\$ millions) - 2 MTW Avg. Rqmts
Contamination Avoidance	11	9	15.2
Individual Protection	39	18	623.3
Collective Protection	7	7	33.8
Decontamination	10	5	106.2
Medical	12	7	392.8
<b>TOTAL</b>	<b>79</b>	<b>46</b>	<b>\$1171.3 M</b>

**Funding Shortfalls by Service**

Service	End Items - jointly	Consumables –	Total Funding
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	<b>funded (\$ millions)</b>	<b>Service funded (\$ millions)</b>	<b>Shortfalls (\$ millions) - 2 MTW Avg. Rqmts</b>
Army	70.6	782.2	852.8
Air Force	100.5	131.4	232.0
Navy	31.3	184.8	216.1
Marine Corps	33.3	72.8	106.1
<b>TOTAL</b>	<b>\$235.7 M</b>	<b>\$1171.3 M</b>	<b>\$1407.0 M</b>

In the contamination avoidance commodity area, equipment shortfalls are seen in the AN/UDR-13, AN/PDR-43, AN/PDR-65, AN/PDR-75, CP-95, and PP-4276/PD radiacs and accessories, the CAM/ICAM, ACADA, and M21 RSCAAL. Consumable shortfalls exist for the M8 and M9 detector papers, M272 Water Test Kit, M256A1 Detector Kit, M273/M293 Maintenance Kits, and BA-5590 and BA5800 batteries. In the individual protection commodity area, equipment shortfalls exist for the MCU-2/P Mask, AR-5A/P22P2, M41 PATS; M40, M42A2, and M45 Masks; the Clothing Test Kit, and the Mask Communications Adapter. Consumable shortfalls include the JSLIST Suit, SCALP, Chemical Protective Undergarment, CWU-66/77P, CP Helmet Cover, M40 Hood, M40 Second Skin, EOD M-3 TAP, CP Socks, CP Footwear Cover, Disposable Footwear Cover, MCU-2/P Hood, 7-, 14-, and 25-mil gloves, Glove Inserts, Aircrewman Cape, C2/C2A1 Filter Canisters, and several TAP accessories from the Air Force. The redefined 2 MTW requirements along with recent reductions in the number of available BDOs were responsible for new shortfalls identified in the projected inventory of JSLIST Suits.

In the collective protection commodity area, the M20A1 SCPE remains short of its requirements. Most of the consumable large filters are short their requirements, to include the M12A2, M13, M18A1, M19, and M48A1 filters, and the Filter Set for M59/M56/Shipboard, and the Shipboard CPE Pre-Filter. In the decontamination commodity area, equipment shortfalls exist for the M13 DAP and the M17-series LDS. Consumable shortfalls exist for nitrogen cylinders used in the M11 DAP, M295 Decon Kit, STB, and DS-2, in particular the 1 1/3 quart can, and M13 Can. The DS-2 shortfalls represent the bulk of the decontamination consumable shortfalls, but the impact of the re-defined average two MTW requirements is lessened by a return to JCHEMRATES III requirements for DS-2. In the medical CB defense commodity area, shortfalls of the NAAK/ATNAA, Atropine and Pralidoxime Chloride Autoinjectors, tetracycline, PB tablets, and the Antidote Treatment Kit for Cyanide, exist. There are also shortages of Decontaminable Folding Litters. Recent definition of requirements for Ciprofloxacin highlighted shortages in that area also.

The findings in Table 7.1 do not necessarily correspond with the FY02-07 CB Defense Program Objectives Memorandum (POM) Strategy's Overguidance Issues (OGIs), nor should they be expected to. The LSP numbers reflect a readiness and sustainment analysis of fielded equipment as of 1 October 2000 against the April 1999 JCHEMRATES IV study, and includes new equipment that is in production and has begun fielding by FY01. The CB Defense POM Strategy identifies desired funding for specific programs that are being fielded during and after FY02, reflecting Service priorities and other influencing factors. Both documents address the two MTW requirement scenario, but use differing methodologies to arrive at their conclusions.

The CB Defense POM Strategy identifies procurement shortfalls in development and production of NBC defense equipment, while the LSP identifies sustainment shortfalls that must be procured through Service O&M funds. The LSP does not duplicate the funding requirements of the CB Defense POM Strategy.

There have been a number of assessments on industry's ability to address shortages of NBC defense equipment, where particular shortages have been identified as being critical. The NBC defense sector remains at moderate risk, as it is composed largely of small firms that are reliant on defense work. Over the past year, the U.S. Army Material Systems Analysis Agency continued assessments on critical items identified in the JCHEMRATES Study. These studies focused primarily on identifying industry's ability to surge produce NBC defense equipment to make up shortfalls in the DoD inventory during a two MTW scenario of 120 days. The results of the initial screenings indicate that the overwhelming majority of NBC defense firms cannot start up from their current cold bases to fill DoD shortfalls within four months. In many cases, additional procurements would assist in reducing these critical areas; in a few instances, more guidance is necessary to strengthen key areas of the NBC defense sector.

Maintenance sustainment of fielded NBC defense equipment includes both depot maintenance and contractor logistics support (DM/CLS) efforts. Our study identified funding shortfalls among the Services that inhibit their full maintenance capability. The Army reported a funding shortfall of \$2.947 million and Navy depots reported a shortfall of approximately \$200,000. The Marine Corps reported \$9.7 million of unfunded repair requirements which includes part of a Product Improvement Plan for masks. Air Force depots have not reported any funding shortfalls specific to NBC defense equipment maintenance. This study also addressed the future maintenance and sustainment funding requirements for NBC defense equipment to be fielded between FY01-07. We determined preliminary maintenance and sustainment cost drivers for twelve developmental items, to include the, BIDS JBPDS Platform, JCAD, Block I and Block II JBPDS, JWARN, MICAD, JSLSCAD, LNBCRS and LAV version of the JSLNBCRS, JTCOPS, M48 Mask, JSGPM, JSCESM, JSAM, JPACE, and Modular Decon System. Some of the funding requirements represent a rough order of magnitude estimate of what the burden may be, as a forecasting tool for the Service project managers and military depots. Others were from data supplied by program managers at the JSMG's request at their respective commodity area reviews. Future iterations of this report will return to these items as their logistics concepts mature.

This report has identified the various maintenance sustainment efforts for developmental programs to be fielded in the next seven years. The general trend follows DoD trends of decreasing the logistics footprint of systems, thus decreasing the cost of repairs and turnaround repair time, maximizing their availability for troops on the battlefield. Maintenance sustainment efforts are taking an increasingly joint aspect. The Navy's Crane Depot has constructed a depot maintenance capability specifically for joint service biological defense programs. Given the sophisticated nature of these detectors and their critical contributions to the DoD NBC defense program, this asset will visibly increase overall readiness by ensuring quick turnarounds.

Overall, the NBC defense logistics situation is improving, given a downsized force structure and consolidated joint requirements. With the four Services' and DLA's approval of the JCHEMRATES IV requirements, the burden of planning and anticipating joint service requirements of NBC defense end items and consumables will become easier as both logistics planning offices and DoD item managers are working with the same numbers.

Complications with current inventories of BDOs and DS-2 have introduced potentially large shortfalls for protective suits and decontaminants for thorough decontamination. Additionally, the continued lack of total asset visibility over unit-level inventory continues to concern DoD managers. A number of particular items continue to exhibit extreme shortages, due to continued historical patterns of low peacetime demands and high wartime requirements (e.g., large collective protection filters, decontamination kits, batteries, and antibiotics). The Services have responded to these issues since the August 2000 data call, and are addressing these shortages through a variety of initiatives. The Services have several efforts underway to consolidate stocks of CB defense materiel that should result in an increased awareness of chemical defense equipment inventory.

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# **Appendix A:**

## **DoD and Service Data Call**





**Appendix B:**

**JCHEMRATES IV –**

**Summary of MTW Requirements**

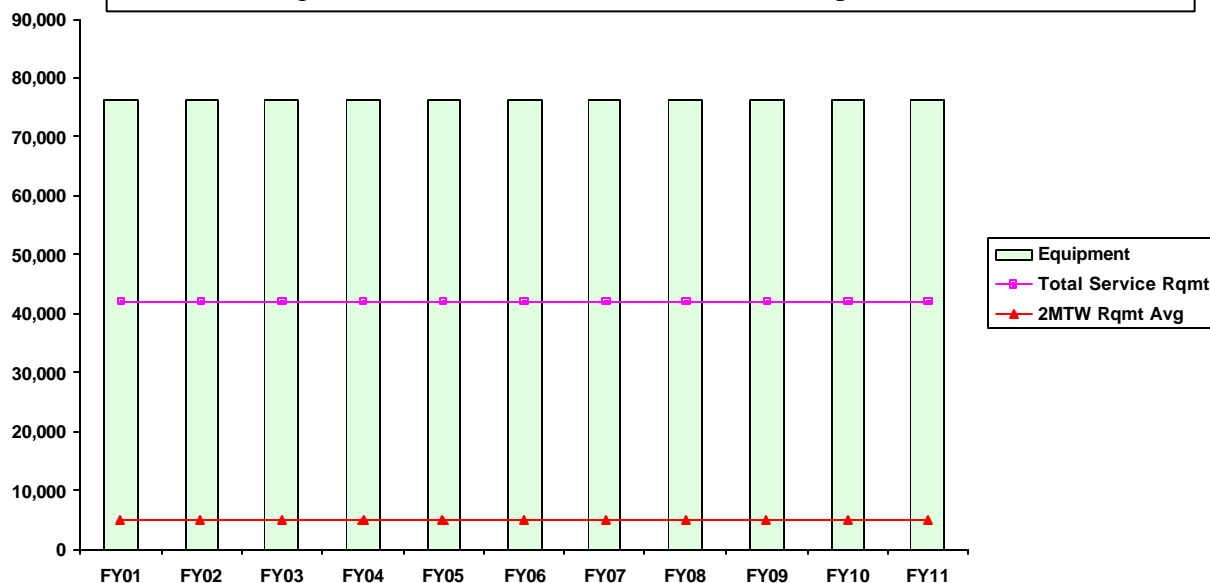
**Appendix C:**

**Contamination Avoidance  
Program Charts**

# EXAMPLE CHART

## Item's Official Nomenclature

Bar chart reflects on-hand quantities plus identified Service/DLA procurements. Lines indicate the total rqmt and MTW rqmt. Expiration due to shelf life is included only if item has a non-extendable shelf life, a planned disposition date, or item manager has calculated shelf life in the consumption rate.



National Stock Numbers

PHOTO

**Description:** Summary of item capabilities and intended use

**Unit Cost:** Current cost per item

**Shelf Life:** Expected shelf life of item

**2 MTW Risk Assessments:**

Identifies if on-hand (as of 30 Sept 01) or projected (FY07) quantities of item meets current MTW requirement, and readiness risk [Low (> 85% fill), Moderate (70-84% fill), or High (< 70% fill)]

**Industrial Base:** Summary of IB status and recommended actions

**Avg. Annual Consumption Rate:**

As identified by item manager

POC: DoD/Service item manager

Allocation By Service	Total MTW Rqmt. (Avg)	FY01 Stockage (as of 30 Sept 01)	FY07 Stockage (projected)	Funding Req'd to Buy Out FY01 Shortfall (Avg Use)
Army	Identified 2 MTW requirement (from JNBCDB or JCHEM - RATES IV, or Service-generated number)	Total stocks on hand at the end of FY01, not accounting for peacetime consumption	Total expected stocks on hand in FY07, not accounting for peacetime consumption	For consumable items, difference between FY01 stockage and MTW rqmt multiplied by unit cost yields cost to each Service of filling respective MTW rqmt of this item. In some cases, DLA stocks and newly fielded items will diminish impact of shortfalls
Air Force				
Navy				
Marine Corps				
TOTAL				

**Appendix D:**

**Individual Protection  
Program Charts**

**Appendix E:**

**Collective Protection  
Program Charts**

**Appendix F:**

**Decontamination  
Program Charts**

**Appendix G:**

**Medical  
Program Charts**



# **Appendix H:**

## **Industrial Base Assessments**

## EXAMPLE CHART

NSN: (National Stock Number)

Nomenclature: **Name of the Item**

Unit Price: \$

U/I: (Unit of Issue)

Ref: page D-10 (illustrative chart in appendices)

NICP: (National Inventory Control Point)

Item Manager: Point of Contact, Telephone No.

MTW Requirements: (DoD 2 MTW Rqmts, as stated in Appendix A)

Assets: (DoD total assets as of 30 Sept 01, as stated in Appendix A)

Shortfall: (Difference between requirements and assets)

### Projected Buys:

<u>Year</u>	<u>FY02</u>	<u>FY03</u>	<u>FY04</u>	<u>FY05</u>	<u>FY06</u>	<u>FY07</u>
Quantity	600	0	0	0	0	0

**Industrial Base Capability:** (lists current and/or past producers and production capacity of each producer)

Current (or Past) Producers:

Maximum Production Capacity:	Time Period (days)			
	<u>0-30</u>	<u>31-60</u>	<u>61-90</u>	<u>91-120</u>
Cold Base:	0	5,000	10,000	20,000
Warm Base:	0	0	0	0

**Analysis:** This is a cold base item. Buys are in progress for XXL sizes not available under NSNs. Manufacturer's maximum production rate is 20,000 per month.

**Findings:** Inventory shortfall can not be offset by production capability in 120 days. Additional analysis is required to explore options.